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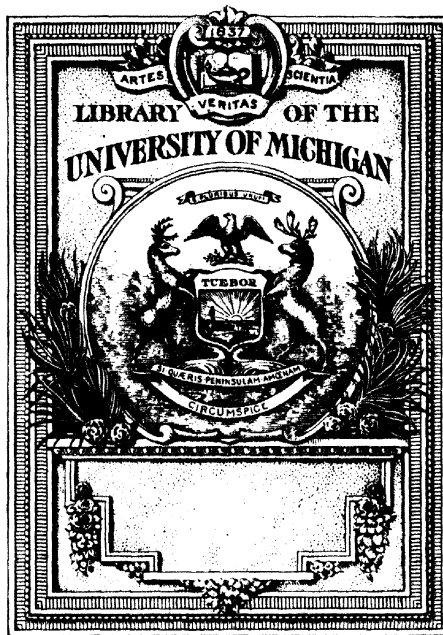


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# FAUNA HAWAIIENSIS

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# FAUNA HAWAIIENSIS

BEING THE LAND-FAUNA OF THE  
HAWAIIAN ISLANDS

**VOLUME III**

BY VARIOUS AUTHORS

**1901—1910**

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# FAUNA HAWAIIENSIS

VOL. III. PART VI.

## *COLEOPTERA. IV*

R. C. L. PERKINS, HUGH SCOTT, AND D. SHARP

## *STREPSIPTERA*

R. C. L. PERKINS

## *THYSANOPTERA*

R. S. BAGNALL

## *ACARINA*

N. D. F. PEARCE

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*November, 1910.*

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# FAUNA HAWAIIENSIS

OR THE

## ZOOLOGY OF THE SANDWICH (HAWAIIAN) ISLES:

Being Results of the Explorations instituted by the Joint Committee  
appointed by

THE ROYAL SOCIETY OF LONDON FOR PROMOTING NATURAL KNOWLEDGE  
AND THE BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE

And carried on with the assistance of those Bodies and of the Trustees of  
THE BERNICE PAUAHI BISHOP MUSEUM AT HONOLULU.

EDITED BY

DAVID SHARP, M.B., M.A., F.R.S.

SECRETARY OF THE COMMITTEE.

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## COLEOPTERA.

## V. COLEOPTERA (VARIOUS).

By R. C. L. Perkins, Hugh Scott, and D. Sharp.

Fam. ANOBIIDAE<sup>1</sup>.

The Anobiidae are represented by three genera containing endemic species, and by three genera containing species which are certainly introduced. Of the former, one genus also inhabits the warm parts of America, the other two are endemic. These genera contain, as here described, or listed, 134 species divided as follows: *Holcobius* 12, *Xyletobius* 52, *Mirosternus* (the non-endemic genus) 70. The three other genera contain in all but five species. In addition to these there are, I believe, one or two species representing other genera, which have been quite recently imported into Honolulu. Material is not at hand for the determination of these. So far as my own experience in working out Hawaiian insects is concerned, I have found the large genera *Xyletobius* and *Mirosternus* by far the most difficult of any group that I have undertaken, and I need hardly say that I am far from satisfied with the result, in spite of the great length of time that I have spent on this work. I think that years of careful observations in the field as well as in the study would be necessary for acquiring a thorough knowledge of these difficult insects.

## HOLCOBIUS Sharp.

*Holcobius* Sharp, Tr. Ent. Soc. London, 1881, p. 522.

The species of *Holcobius* are much less numerous, and the individuals much less easily procured, than many of those belonging to *Xyletobius* and *Mirosternus*. I have seen one or two of the species flying in some numbers at dark and all are nocturnal. Three of the species have not the form of palpi characteristic of *Holcobius* and will, doubtless, be removed from the genus. The following groups are easily recognized.

<sup>1</sup> By R. C. L. Perkins.

Palpi with emarginate terminal joints.

Pronotum seen from above appearing notched near the front angles....*H. major, simulans, insignis, haleakalae, hawaiiensis, diversus.*

Pronotum not appearing notched.

Elytra smooth, shining, glabrous, striae coarsely punctured....*H. glabricollis.*

Elytra not glabrous and polished, striae distinctly punctate....*H. granulatus, affinis.*

Palpi with terminal joints not apically emarginate....*H. simplex, minor, frater.*

(1) *Holcobius major* Sharp.

*Holcobius major* Sharp, Tr. Ent. Soc. London, 1881, p. 521.

Varies somewhat in size and in the colour of the antennae.

HAB. Maui: Haleakala, 4000—5000 ft. (Blackburn, Perkins).

(2) *Holcobius simulans*, sp. nov.

*H. majori* forma colore et magnitudine simillimus, sed pronoto toto opaco, distincte subtiliter sculpturato, interstitiis parum convexis facile distinguendus. Long. 10 mm.

The antennae in the single example are nearly black, excepting the apical joints. The sculpture of the pronotum is extremely fine and dense on the disc, where are a few shallow punctures, the surface very dull, the elytral interstices seem to be even flatter than those of *H. major*.

HAB. Maui: Haleakala, 5000 ft., but not taken with *H. major*.

(3) *Holcobius insignis*, sp. nov.

Statura majore, nigricans, robustus, opacus, antennis plus minus testaceis. Pronotum dense aureo-pubescent, granulatum, lateribus, desuper aspectis, antice quasi emarginatis. Elytra fusco-pubescentia, subfortiter striata, striis punctatis, interstitiis convexiusculis. Long. 11 mm.

Much more robust than *H. major* and *H. simulans* and with the thorax very densely clothed all over with golden pubescence. Punctures on the striae coarser than in most of the allied species, but difficult to see, unless denuded.

HAB. Kauai; 4000 ft.; one specimen.

(4) *Holcobius haleakalae*, sp. nov.

Sordide niger aut fusco-niger, opacus, dense fusco-pubescent, pube sub-aureomicante, antennis tarsisque (ex parte) testaceis. Antennarum articulus 9 ultimo evidenter brevior. Pronotum totum peropacum, subtiliter granulatum, lateribus quasi emarginatis.



Elytra sat dense appressa pubescentia vestita, subtiliter striata, striis punctatis, interstitiis haud convexis, parce subtiliter granulatis. Long. 8.5 mm.

Very like *H. insignis*, but of only about half the bulk.

*H. haleakalae* var. *chrysodytus* nov.

Pubescentia aurea vestitus.

Apparently not variable, so far as the few examples taken are concerned, except for the golden-clothed variety named above. Sometimes two or three of the intermediate joints of the antennae are infusate.

HAB. Maui: Haleakala, 4500—5000 ft.; I believe I have also taken it on Oahu.

(5) *Holcobi* *hawaiiensis*, sp. nov.

*H. haleakalae* persimilis, sed antennis pedibusque atris, pronoto anterieus medium versus minus fortiter granulato distinguendus. Long. 7.5 mm.

I see no characters to distinguish a specimen from Hawaii, excepting those given above. I believe I have since met with the species there, and it is attached to tree-ferns. *H. haleakalae* was found on dead Ohia trees. In certain positions the interstices of *hawaiiensis* seem to be a little convex.

HAB. Hawaii: Kona, 3000 ft.; subsequently also taken at Kilauea.

(6) *Holcobi* *diversus*, sp. nov.

Sat elongatus, parum robustus, pronoto subnigricante, elytris fusco-brunneis, antennis pallidioribus, minus dense pubescens. Antennarum articulus 4 triangularis, longior quam trans apicem lator, sexto multo brevior; articulus ultimus praecedentibus multo longior. Pronotum subnitidum, supra punctatum, latera versus granulatum, lateribus, desuper aspectis, fortiter quasi-emarginatis. Elytra minus dense pubescentia, sat profunde striata, interstitiis rugulosis striis haud evidenter punctatis. Long. 6 mm.

Very distinct from any of the preceding species and superficially more resembling some of the following, which lack the quasi-emarginate character of the pronotum.

HAB. Kauai: 4000 ft.; one example.

(7) *Holcobi* *affinis*, sp. nov.

Fusco-brunneus, sat elongatus, antennis testaceis, pubescens. Caput crebre et conspicue granulatum. Pronotum crebre ubique granulatum, lateribus, desuper aspectis, haud quasi emarginatis. Elytra striata, pallide pubescentia, interstitiis dense et minute granulato-asperulis. Long. 7 mm.

Easily distinguished from the very closely allied *H. granulatus* Sh. by its paler colour and the more conspicuous pubescence.

HAB. Hawaii, Molokai, Oahu and Kauai.—Hawaii, Kona, 4000—6000 ft.; Molokai, 3000 ft.; Oahu, 2000 ft.; Kauai, 4000 ft.; bred from dead wood of *Euphorbia* and often seen flying at dark.

(8) *Holcobius granulatus* Sharp.

*Holcobius granulatus* Sharp, Tr. Ent. Soc. London, 1881, p. 520.

Varies a little in sculpture, the striae being more clearly and largely punctured in some specimens than in others, while the interstices are sometimes slightly convex, sometimes flat.

HAB. Maui, Hawaii.—Maui, Haleakala, not rare in dead Ohia trees; Hawaii, Kilauea, one example.

(9) *Holcobius glabricollis* Sharp.

*Holcobius glabricollis* Sharp, Tr. Ent. Soc. London, 1881, p. 520.

HAB. Oahu, Maui.—Oahu, scarce at low elevations in the mountains on Koa trees. Maui, Haleakala, 4000 ft., where one or two examples were taken on Koa, but I do not find these in the collection. I have a note of its occurrence and well remember the fact.

(10) *Holcobius* (?) *simplex*, sp. nov.

Fusco- aut atro-brunneus, minus opacus, subtiliter pubescens, antennis tarsorumque apicibus testaceis. Pronotum totum subtiliter punctatum, haudquaquam granulatum, lateribus haud quasi-emarginatis. Elytra levius striata, striis anterieus punctatis, interstitiis crebre et conspicue punctulatis. Long. 5.5 mm.

Var. *a.* Niger, antennis testaceis.

Distinguished by the sculpture of the pronotum, the form of the palpi, as mentioned in the introductory remarks. The antennal joints are less elongate than those of *H. major*, *haleakalae* and *diversus*.

HAB. Kauai, Molokai.—Kauai, 4000 ft.; Molokai, 3000 ft. Four examples.

(11) *Holcobius* (?) *minor*, sp. nov.

Minor, brunneus aut fusco-rufus, subtiliter pubescens, parum robustus, antennis testaceis (nonnunquam totis vel ex parte obscuricoloribus). Pronotum subtiliter pubescens, vix nitidum, lateribus haud quasi-emarginatis, versus angulos anteriores obsolete granulatum-rugulosum, supra subtilissime punctulatum. Elytra distincte subtiliter striata, striis impunctatis, interstitiis ruguloso-punctatis. Long. circa 4 mm.

Distinct by its small (but variable) size and otherwise from all but the following.

HAB. Oahu, Molokai.—Molokai, 3000 ft. ; since found on Oahu near the coast. Not common.

(12) *Holcobius frater*, sp. nov.

Minor, parum robustus, subtiliter pubescens, fusco-niger (nonnunquam plus minus brunneus aut rufescens) antennis rufo-testaceis, et sat brevibus. Pronotum totum opacum et subtiliter granulatum, lateribus desuper aspectis haud quasi-emarginatis. Elytra subtiliter striata, striis impunctatis, interstitiis obsolete rugulosis. Long. circa 4 mm.

The type of this species is from Kauai, but it also occurs on Oahu. Examples from the latter island, that I have recently taken, generally have the pronotum less dull and granulate than the type and are brighter in colour.

HAB. Oahu, Kauai.—Kauai, 2000 ft. ; Oahu, 1200—1500 ft.

XYLETOBIUS Sharp.

*Xyletobius* Sharp, Tr. Ent. Soc. London, 1881, p. 519.

The species of *Xyletobius* form a number of groups, difficult to define, but readily recognized after a reasonable time spent in the study of a representative collection. Some of these groups will certainly form distinct genera, when they are still further studied. In these descriptions I have not used characters drawn from the underside of the insect, especially the distance between the middle coxae, which is much greater in some (e.g. *X. monas*) than others, because it appears to vary in the sexes of some species. Nevertheless, it will certainly prove an important character. My grouping is largely based on male characters (i.e. the length of the antennae) which is of course unsatisfactory, but, at present, the best method I can discover.

**I.** Species in which the posterior lateral angles of the pronotum are distinct and not so rounded off as to be effaced. Pronotum always very uneven, raised or tuberculate, so that in lateral aspect the upper outline is angulated towards the middle.....*X. walsinghamii*, *durranti*, *sylvestrii*, *hawaiiensis*.

**II.** Species with the posterior pronotal angles rounded off and effaced ; pronotum very rarely formed as in the preceding section.....All the other species of the genus.

The latter group may be subdivided into a number of sections with the following characters :

- (1) Species entirely black, with the antennae very strongly serrate (for the genus), these and the legs black, the elytral striae hardly at all punctured (elytra scantily tomentose and pronotum very little convex above in profile in *X. nudus*).....*X. nudus* and ? *nigrinus* Sh.

- (2) Species usually brown of various shades or dull black or dark fuscous, the tomentum always scanty so that the sculpture of the insect is easily seen in dorsal aspect, form elongate, numerous evident punctures can be seen on the striae, second stria always confluent with the third alone at the apex, where they are very distinctly impressed. Pronotum seen in profile with its outline straight or hardly curved or convex.....*X. grimshawi* and *dollfusi*.
- (3) Species with elongate or very elongate antennae in the ♂, the several joints before the apical one all strongly elongate and usually very slender.
- (a) Species large or at least robust, never with yellow elytral spots or fasciae, the elytral striae distinct to the apex, the second confluent with the third only (as a very rare variety the second and third free at apex).....*X. marmoratus*, *meyrickii*.
- (b) Species not striate as in (a), the pronotum anteriorly strongly margined throughout, the margin usually shining.....*X. proteus*, *mesochlorus*, *nuptus*, *pele*, *euceras*, *mimus*, *submimus*, *affinis* Sh. (?).
- (c) Species not striate as in (a), sometimes yellow marked, the pronotum indistinctly or feebly margined in the middle in front; eyes of ♂ of the usual size.....*X. oculatus*, *suboculatus*, *carpenteri*, *ashmeadi*, *blackburni*, *beddardi*, *forelli*, *brunneri*.
- (d) Species as in (c), but the eyes of the ♂ abnormally large, the width of the two together at least subequal to that of the space between them, or sometimes much larger still.....*X. megalops*, *euops*, *insignis*, *kirkaldyi*.
- (4) Species with short antennae in both sexes, the several joints before the apical one not strongly elongate in the ♂ and never very slender.
- (a) Dark markings of elytra so disposed as to make a pattern of several alternate light and dark transverse bands or the elytra are dark with a very conspicuous transverse pale mark on the apical declivous portion; the interstices apically near the suture strongly convex.....*X. euphorbiae*, *cyphus*, *monas*.
- (b) Elytra with a great brown or golden subtriangular spot of tomentum, extending to the shoulders at the base, and with its apex beyond the middle of the suture.....*X. collingei*, *speiseri*.
- (c) Pronotum with two conspicuous round spots of pale tomentum.....*X. sharpi*.
- (d) Elytra with conspicuous yellow spots or bands.....*X. simoni*, *fraternus*, *roridus*.
- (e) Pronotum in dorsal aspect with the front margin laterally a little prominent (before the deflexed front angles) or rarely angulate or subangulate; not simply rounded; species mostly very small and narrow.....*X. sykesii*, *praeceps*, *mundus*, *aurifer*, *chryseis*, *flosculus*.
- (f) Pronotum in dorsal aspect with the front margin simply rounded at the sides, not slightly prominently rounded, or subangulate.....*X. scotti*, *stebbingi*, *lineatus*, *serratus* Bl. (?), *lasiodes*, *sulcatus*.

Although in the second part of this table the males alone are actually dealt with, yet in nearly all cases the characters used are also equally applicable to the females. The latter sex, in the sections wherein the males have strongly elongate antepical antennal joints, also generally has these too slender and elongate to be confused with the males in the other group, having short antennae. Only in two or three cases do the females, that belong to males with long antennae, have these organs with the joints so shortened as to be similar to those males that have the antennae most developed in the other section. *Xyletobius aleuritidis* is not included in the table, as I doubt whether it really belongs to the genus.

The measurements of the Hawaiian Anobiidae, here given, are mostly taken from the type specimens. It is only necessary to examine a series of any species to find considerable variation in size, so that this becomes unimportant for specific distinction, unless there is a very considerable difference between that of any two species.

(1) *Xyletobius walsinghamii*, sp. nov.

Statura maxima, sat elongatus, totus dense pallido-tomentosus, antennis rufis aut fuscis. Caput dense tomentosum, oculis majoribus, antennis (praecipue maris) longis, articulo sexto et sequentibus fortiter elongatis, parum serratis. Pronotum perinaequale, juxta medium fortiter elevatum aut tuberculatum, margine laterali ante angulos posteriores exciso, his distinctissimis, haud rotundatim obsoletis, densissime pallido-tomentosum, antice saepius fusco-variegatum, elevatione plerumque nigro- aut fusco-notata. Elytra densissime pallido-tomentosa, lateribus aut ad media aut usque ad apices nigro- aut fusco-limbatis, stria secunda cum tertia sola ad apices confluente. Long. 6.5 mm. var. *minor*, elytrorum dorso multo magis fusco-variegato, statura minore. Long. 4.5 mm.

I have seen only a few examples of this remarkable insect, which is the largest of the Hawaiian *Xyletobius*, and in some respects recalls the genus *Holcobius*. Were it not that it appears to be connected with more ordinary forms by *X. silvestrii*, I should have separated it and its close ally, as forming a different genus. If denuded of tomentum the colour of the insect is usually red, and when thus bare, the elytra show a somewhat deep striation, the interstices being noticeably convex. The larva of this insect is not rare near Honolulu, not only in native woods, but also in introduced dead trees, such as the guava. For this reason I long suspected it of being an introduction from some other country, but the discovery that there is a closely allied species on Kauai and of its relationship to *X. silvestrii*, as mentioned above, sufficiently prove that it belongs to the endemic series.

HAB. Oahu, Maui :—500 to 4000 ft., widely spread and no doubt not rare.

(2) *Xyletobius durranti*, sp. nov.

Forma facieque *X. walsinghamii*, et eisdem modis variabilis, forma pronoti bene distinctus. Pronotum, antice visum, sat fortiter curvatim transverse elevatum, elevatione haudquaquam conico-truncata. Long. 6 mm.

HAB. Kauai; below 2000 ft. to over 4000 ft. in the mountains; no doubt generally distributed, but neglected.

(3) *Xyletobius silvestrii*, sp. nov.

Rufescens, elongatus, subparallelus, plus minus infuscatus, antennarum articulis duobus basalibus aut pluribus rufis, caeteris plus minus infuscatis, pallide tomentosus. Antennae minus fortiter sive mediocriter elongatae, articulo septimo conspicue longiore quam latiore, octavo fere bis longiore quam latiore, sequentibus fortiter elongatis. Pronotum perinaequale, juxta, sive paullo post medium, fortiter elevatum, tomento pallido subvariegatim conspicue vestitum, angulis posterioribus lateralibus distinctis, quamvis obtusis. Elytra fortius striata, stria secunda cum tertia sola ad apices confluente, interstitiis subconvexis, pallide tomentosa, tomento haud laevigato, sed quasi maculas parvas male definitas nitidiores formante. Long. 3.5—4.5 mm.

This species cannot possibly be confused with any other. It is obviously allied to *X. walsinghamii*, but differs in having the sides of the pronotum nearly straight in front of the hind angles, instead of being conspicuously excised, and the angles themselves consequently are less conspicuous. There are many other differences in detail of structure in addition to that of size. This insect seems to be rare, as I have seen only three or four examples, including a pair taken *in cop*.

HAB. Oahu; 2000 ft. or somewhat less.

(4) *Xyletobius grimshawi*, sp. nov.

Fusco-niger, fusco-brunneus aut brunneus, nonnunquam nigricans vitta lata flavescente longitudinali ab humeris elytrorum extensa ornatus, antennarum articulis nonnullis basalibus saepe rufescentibus, caeteris fuscis, pedibus fuscis aut rufescentibus, variabilibus, sat angustus, parce pallide tomentosus. Antennae breviores, sat serratae, articulo septimo minus elongato. Pronotum breve, latum, fortiter transversum, opacum, obscure sculpturatum. Elytra conspicue impressa, striis sat sinuatis, parce tomentosa, stria secunda cum tertia sola ad apices occurrente, ibique plerumque fortiter impressa. Long. 3 mm.

This species varies a good deal but is always easily separable from any other by the following characters. It is scantily tomentose or pubescent, has shortish antennae in either sex (these not differing greatly), the pronotum seen in profile has its upper outline almost straight, hardly or not at all convex. The striation is as described above, and the elytral impressions are always conspicuous. The Kauaian examples tend to form a distinct species, characterized by lighter striation and more elongate elytra. In many specimens these features are very strongly marked, but others are identical with the Oahuan ones, and others are intermediate. The brown or dark fuscous colour of the insect, save in exceptional specimens, is very characteristic.

HAB. Kauai, Oahu.—This Anobiid is more frequently met with than any other in the immediate neighbourhood of Honolulu. A strongly striated example from this range has served as the type of the species.

(5) *Xyletobius dollfusi*, sp. nov.

Fusco-niger, opacus, parce tomento fusco subtilissime vestitus, antennis plerumque nigricantibus, articulo secundo rufescente. *X. grimshawi* evidenter affinis, pronoto supra parum convexo, lato, medio minus fortiter producto, stria elytrorum secunda tertiaque ad apices confluentibus, striis usque ad apices subtiliter punctatis. Statura majore, vestitu, colore, multisque aliis modis subtilioribus distinguendus. Long. 3.75 mm.

The very uniformly dark appearance, and large size gives the above species a very different facies from that of *X. grimshawi*, to which it is closely allied. It is much more bulky than the finely striate and elongate examples of that species from Kauai, and has a finer striation and flatter, wider interstices than the typical Oahuan form. The pronotum, seen in profile, is a little less straight above in outline and the clothing of the elytra has not the same tendency to form pale lines on the interstices. Some examples of *X. dollfusi* are a good deal more elongate than others and seem to me to somewhat connect *X. marmoratus*, a rather isolated species with *X. grimshawi*.

HAB. Hawaii, Kilauea ; apparently rare.

(6) *Xyletobius marmoratus* Sharp.

*Xyletobius marmoratus* Sharp, Tr. Ent. Soc. London, 1881, p. 517.

Colore variabilis, rufus, rufo-fuscus, rufo-niger aut nigricans, elytris fortius quam in plurimis speciebus impressis, striis fortius sinuatis, secunda cum tertia sola confluenta.

I believe I have identified this species correctly from Dr Sharp's description. It varies a good deal in colour, some examples are dark fuscous, becoming distinctly red in parts. Some are not half the size of others, those from Oahu being on the average much less than those from Molokai. The striation (which is extremely distinct right to the apex) is apparently constant and a strong specific character.

HAB. Oahu, Maui, Molokai, Lanai.—Not taken anywhere in large numbers.

(7) *Xyletobius meyrickii*, sp. nov.

Statura majore, niger, flavescenti aut cinereo tomento conspicue vestitus, tibiis tarsisque saepius nigricantibus aut obscure rufis. Caput dense tomentosus, oculis mediocriter magnis, latissime separatis, antennis maris sat fortiter, feminae mediocriter, elongatis, articulo septimo et sequentibus maris valde, feminae conspicue elongatis. Pronotum subaequaliter tomentosum, plagis nonnullis quasi nudis notatum. Elytra



minus inaequalibus, leviter striata, stria secunda cum tertia sola conjuncta, aut harum apicibus liberis, stria quarta et quinta ad apices confluentibus, et praecedentibus multo brevioribus. Long. 4.25 mm.

Described from examples in fine condition, some being almost entirely abraded. It is a most distinct species on account of its large size, generally uniform clothing and the condition of the striation, which is almost always constant. The pronotum is not so conspicuously margined in front as in *X. proteus*. The tomentum of the elytra often has a peculiar iridescent or prismatic reflection. The colour of the legs and antennae is not quite constant; one example has the latter largely yellowish.

HAB. Hawaii, on the West side of Mauna Loa from 2000—5000 ft., mostly 4000 ft. or upwards.

(8) *Xyletobius proteus*, sp. nov.

Plerumque major, sat robustus, antennis sat elongatis, capite lateribusque pronoti densissime pallido-tomentosis, pronoti margine antico distincte fortius ubique elevato, nitido. Elytra in forma typica tomento pallido et nigro aut fusco longitudinaliter variegata. Long. solit. 3.5 mm.

The above characters are mostly constant in this very variable species. What may be considered as the typical form has the elytra variegated with longitudinal spots or lines of pale and dark tomentum. By spread of the dark colour or its concentration into certain parts and removal from others, or its partial or total disappearance, various striking varieties, having no superficial resemblance in pattern to the typical form are produced. By the examination of many specimens I have been able to trace the mode of formation of the extreme varieties. The actual colour of the integument (apart from the clothing) varies from entirely red to black.

A few of the most striking varieties of *X. proteus* may be characterized as follows:

*X. proteus* var. *simplex* nov.

Rufescens aut niger, elytris ubique tomento pallido, cinereo aut flavescente aut aureo, vestitis.

This form probably arises in two ways (1) by the spread of the pale tomentum over the whole surface, (2) by the dark tomentum of the typical form becoming flavescens and the spread of this over the general surface. Varieties in which the elytra are cinereous with light fuscous or yellowish markings may be looked on as intermediate between the typical form and the var. *simplex*. These intermediates are common.

*X. proteus* var. *maurus* nov.

Elytra nigro- vel fusco-tomentosa, apicibus extremis nonnunquam cinerascentibus.

A dark form, the elytra nearly uniformly dark, the tomentum generally with a ferruginous or golden reflection in certain aspects. About one example in 60 appears to belong to this variety.

*X. proteus* var. *apicalis* nov.

Elytra supra pallide tomentosa, lateribus fasciaeque anteapicali, saepe etiam basi nigricantibus.

In this form, which is numerous, the base of the elytra (usually more widely at the shoulders), the sides, except a space behind the shoulders, and a transverse mark or band near the apex, are black. Rarely this subapical fascia alone is present.

*X. proteus* var. *dorsalis* nov.

Elytra plus minus pallide tomentosa, post media maculâ magnâ trans suturam positâ ornata, fasciaeque subapicali saepe interruptâ.

This beautiful variety is not abundant. Of five hundred specimens counted, only one in fifty belongs to it. I have seen one very good intermediate form, in which the pale tomentum has not been entirely eliminated from the dorsal spot.

*X. proteus* var. *hastatus* nov.

Elytra nigro- vel fusco-tomentosa, ante media maculâ trans suturam positâ, subtriangulâri, pallide tomentosâ ornata.

A very remarkable variation, the pale pubescent spot on the suture being subtriangular (the apex of the triangle in front) and a little produced backwards along the suture.

Only three examples in about 600 examined were of this variety.

*X. proteus* is apparently found on all the islands, but unless *X. nuptus* be considered a mere variety, it was only found abundantly on Hawaii. The var. *apicalis* has been taken on Kauai in company with *X. nuptus* and I have seen one var. *dorsalis* from Oahu, taken with nearly typical *proteus*.

*X. mesochlorus* from Molokai reminds one greatly of the var. *hastatus*, but the pale spot is differently shaped, and occupies a different position on the elytra and it is I suspect nearer to *X. nuptus* than to the var. *hastatus* of *proteus*. After the removal of *X. nuptus*, *X. mesochlorus* and *X. mimus* all Hawaiian Anobiids of large size, with very densely tomentose head and sides of the pronotum, with the anterior margin of

the latter very definitely raised all round, and shining, with elongate antennae, which do not differ greatly in the sexes, though shorter in the female, may be assigned to *X. proteus*.

HAB. All the islands, but taken only rarely excepting on Hawaii; very numerous on that island near the active volcano Kilauea.

(9) *Xyletobius mesochlorus*, sp. nov.

Nigricans et rufus, sat robustus, forma *X. protei*, capite, pronotique lateribus densissime pallido-tomentosis. Pronotum antice distinctissime marginatum, margine laevi, nitido. Elytra fusco-nigro tomento vestita, macula magna, mediali et transuturali, pallide-tomentosa ornata, strigisque aut maculis aliis paucis pallidis. Long. 3.75 mm.

Form and structure very like that of *X. proteus*, but quite distinct in its clothing from any of the known varieties of that species, and apparently very constant, the five examples taken being closely similar. It reminds one a good deal of the var. *dorsalis* with the general colour of the elytra and that of the dorsal spot reversed. Perhaps it should be considered as a local race of *X. proteus* rather than a distinct species, though at present it is not connected with the ordinary forms of that insect by any intermediates.

HAB. Molokai, singly and rarely, 3000—4000 ft.

(10) *Xyletobius nuptus*, sp. nov. .

Rufescens, plus minusve nigro- aut fusco-variegatus, antennarum articulis tribus basalibus plerumque rufis, caeteris nigris. Caput sat dense pallide tomentosum, oculis mediocribus, latissime separatis. Antennae utriusque sexus fortiter elongatae, maris tamen evidenter longiores, articulo septimo circiter bis longiore quam latior. Pronotum latum, antice distinctissime marginatum, lateribus dense pallido-tomentosis, medium evidenter granulatum. Elytra plerumque notis plus minusve elongatis nigris aut fuscis variegata, lateribus versus media saepe macula triangulari aut subtriangulari fusca aut nigra notatis, stria secunda saepe cum quinta ad apicem confluenta, haud quaquam cum tertia sola conjuncta. Long. solit. 3.5 mm.

*Xyletobius nuptus* var. *kauaiensis* nov.

It will be convenient to use this name for the Kauai form of the above, even though the two are not definitely separable in all cases. The variation, so far as I can judge from the specimens collected, is very different on Lanai and Kauai, though certain individuals from each island closely resemble one another. In examples from Kauai the dark elytral markings are usually more elongate and sometimes are so extensive that nearly the entire elytra are black. Near their middle there is in many

examples an apparently bare, round, red spot, this being due to the direction of the pubescence and not really to its absence. The smallest examples are hardly one-fourth the bulk of the larger ones.

In both forms the colour of the legs varies from red to dark, and the lateral dark elytral marking, often triangular in shape, may lose its characteristic form by confluence with other dark markings. It becomes a question whether *X. nuptus* is really more than a special form of *X. proteus*. Both on Lanai and Kauai though *nuptus* is the dominant form in various localities, yet on both islands one or two individuals have occurred, that appear to belong to *X. proteus*. It is necessarily difficult to accurately distinguish between species so closely allied, each being very variable, but the average size of *X. nuptus* is much less, it is normally more elongate, and in proportion to its size the antennae of the male seem to be more strongly developed. It is the more typical forms of *X. proteus* that are most like *X. nuptus*.

HAB. Lanai, Kauai.—Probably common as I have examined over fifty examples in all.

(11) *Xyletobius pele*, sp. nov.

Nigricans et testaceus, statura majore, pedibus ex majore parte nigricantibus, antennarum articulis duobus basalibus rufis, pronoto testaceo sive rufescente, medio marginem versus posticum nigromaculato. Oculi mediocres. Antennae sat fortiter elongatae, articulo quinto fortius elongato, quam quartus evidenter longiore, quam sextus multo brevior, articulo septimo et sequentibus gracilibus et valde elongatis. Pronotum latum, antice distinctissime marginatum, margine nitido, partibus nigricantibus exceptis dense pallido-tomentosum, a latere visum supra haud aequaliter convexum. Elytra elongatula, plaga laterali, ab humeris fere ad mediam elytrorum longitudinem extensâ, testaceâ, dense pallido tomento vestitâ, caeteris partibus nigro-tomentosis, lineis maculis que nonnullis cinereis variegatis. Long. circa 4 mm.

No doubt distinct from *X. proteus*, possibly the representative on Hawaii of *X. nuptus* of the other islands; the unique example showing an apparently bare red spot on each side at about their middle in dorsal aspect. This bareness is of course only apparent, as in other species. The upper outline in profile of the pronotum is a good deal sinuate, and far from presenting an evenly convex curve. The dark marking on the pronotum is transverse and trilobate. The testaceous elytral markings, covered with pale tomentum, merge into a sanguineous colour (without pale tomentum) on the dorsum. It is quite probable that the unique example may be a remarkable colour variety and that the typical form is more like that of *X. proteus* or *X. nuptus*.

HAB. Hawaii; Kilauea, a single example was taken in July 1895. It is no doubt a male.

(12) *Xyletobius euceras*, sp. nov.

Colore nigro sive nigrofusco rufoque variegatus, facie totâ *X. nupti*, antennis exceptis. Antennae ♂ longissimae, articulo quarto brevi, haud quaquam longiore quam latiore, quinto fortiter elongato, fere bis longiore quam latiore, et praecedentibus permulto longiore, sexto quam quintus conspicue longiore et graciliore, articulis 8, 9 et 10 perelongatis et gracillimis. Long. 3.75 mm.

Differs in no wise, excepting the remarkable antennae, from some examples of *X. nuptus*. The pronotum has the usual strong shining margin of the *X. proteus* group. From Oahu there was a single mutilated, but no doubt originally fine, example of (probably) this species. Its antennae had been torn off and broken up by unskilled mounting and many joints lost.

HAB. Oahu, Lanai.—Lanai, Koele, 2000 ft., a single ♂ taken.

(13) *Xyletobius mimus*, sp. nov.

Sat robustus, totus tomento cinereo aut subflavescente vestitus, pedibus ex magna parte nigricantibus, antennarum articulo secundo et nonnunquam etiam primo rufescentibus. Antennae utriusque sexus fortiter elongatae, maris quam feminae evidenter longiores, articulo sexto quam quintus multo longiore, articulis 9 et 10 maris valde, feminae sat fortiter elongatis. Pronotum latum, ubique granulatum, margine antico toto sat distincte elevatum et nitidum. Elytra latiora, parum aut haud variegata, stria secunda plerumque cum quinta confluenta, his tertiam quartamque includentibus. Long. 3—3.5 mm.

Very closely allied to *X. proteus*, but so far as the three dozen examples, that I have examined, show, it is very constant and uniform in appearance. Neither the typical form nor any of the varieties of *X. proteus* was taken in company with it. It differs from this species in being of smaller average size, with the antennae comparatively longer. It is excessively close to *X. subminus*, but is of larger average size than that species, and is more robust, the elytra being broader and less elongate.

HAB. Hawaii on the Western side of Mauna Loa, generally in the lowest forest belt, where introduced ants were absent.

(14) *Xyletobius subminus*, sp. nov.

Niger, haud latus, cinereo-tomentosus, *X. mimo* cognatissimus, differt statura plerumque minore, et forma magis elongata. Long. 2.5—3.25 mm.

This is another of the allied forms, which is separable with some doubt from *X. proteus*, of which it might be a small or degraded variety. It is of much smaller average size, of more elongate form and the antennae are as well or better developed than those of normal *X. proteus*, the sides of the thorax and the head are much less

densely covered with tomentum. From *X. minus* it is separable by its smaller average size and its more elongate form, the elytra being usually very decidedly longer. In many examples the elytra are slightly, but distinctly, variegated; the tomentum instead of being uniformly cinereous is to a large extent blackish, so that pale lines are formed thereby. The legs are never altogether bright or clear red like *X. proteus*. I have seen not less than forty examples of *X. subminus*.

HAB. Hawaii, Kilauea near the crater.

(15) *Xyletobius affinis* Sharp.

*Xyletobius affinis* Sharp, Tr. Dublin Soc. III. (Ser. ii) p. 158.

I cannot identify this species with certainty, but I suspect it may be the same as either my *X. minus* or *X. subminus*, though it is equally likely to be distinct from either. The nature of the anterior margin of the pronotum is of extreme importance in differentiating various species of *Xyletobius*, that are very similar in appearance and resemble *X. affinis*, so until this part is examined I should hesitate to assign any of my species to Dr Sharp's.

HAB. Hawaii, Mauna Loa, 6000 ft. (Blackburn).

(16) *Xyletobius aleuritis*, sp. nov.

Piceo-niger aut fusco-niger, statura magna, vivus, ut opinor, totus pallide tomentosus, antennis mediocriter elongatis, articulis quarto quintoque subaequalibus, sat fortiter elongatis, caeteris usque ad decimum quinto vix conspicue longioribus. Long. 5 mm.

I have only seen two examples, found dead, and much abraded, of this species, which is evidently very different from any other. The pronotum is much less strongly margined in front than in *X. proteus* and its allies, the striation is different from that of *X. marmoratus*, as well as the shape of the pronotum, while the antennal characters seem quite peculiar, in the small amount of dilatation of the fourth and fifth joints. In life the insect is probably almost evenly covered with pale flavescent tomentum.

HAB. Oahu; two examples were dug out of dead Kukui wood (Aleurites) in April 1892. I have never met with a specimen since, and doubt whether the insect is a true *Xyletobius*. It was found at a lower elevation than any other.

(17) *Xyletobius oculatus* Sharp.

*Xyletobius oculatus* Sharp, Tr. Ent. Soc. London, 1881, p. 519.

I have examined a series of examples that agree very well with Sharp's description of this species. It varies a good deal in size, some examples being nearly twice as

bulky as others, but very little in general appearance. The female has much shorter antennae, the 6th, 7th, 8th and 9th joints being only moderately elongate instead of very strongly so.

HAB. Hawaii, Kilauea and Kona.

(18) *Xyletobius suboculatus*, sp. nov.

Niger aut piceo-niger, antennarum articulis duobus basalibus rufis, rarius plus minus obfuscatis, pedibus (exceptis nonnunquam anticis) ex maiore parte nigricantibus aut obscuricoloribus. Oculi minores, latissime separati. Antennae maris valde, feminae mediocriter, elongatae; maris articulo sexto fortiter elongato (praecedente multo maiore) et longitudine sequentibus minus inaequali. Pronotum basim versus sat fortiter longitudinaliter convexum, margine antico medio vix aut parum distincte elevato, opacum, dense subtilissime sculpturatum. Elytra sat elongata et angusta, plus minus lineis tomenti cinerei (plerumque parum conspicue) variegata, rarissime unicoloria. Long. 2.5—3.25 mm.

I have examined about 150 examples of this species minutely, and others more superficially. Amongst these are a few, in which the pronotum in part, or wholly, and sometimes the elytra are red or reddish. In some of these examples the legs too are red or yellow. I suspect that the colour of these specimens is due to immaturity, in some it is certainly so. They have much the appearance of some specimens of *X. carpenteri* and perhaps *X. suboculatus* should be considered as a local race of that species. If so, the variation of the two forms is entirely different. To *X. suboculatus* I also refer a few specimens more recently taken on Kauai and Oahu, for I see no characters to distinguish them, in spite of the fact that *X. carpenteri* is found on the intermediate islands. *X. suboculatus* is not very variable, as compared with other species. Some examples have but little variegation of the elytra, but this is very rarely, if ever, entirely absent (unless abraded) and when almost absent, the surface is generally covered with a blackish or fuscous tomentum, not with the grey colour of *X. oculatus*.

HAB. Kauai, Oahu, Hawaii.—Hawaii, Kau and Hilo districts, on Mauna Loa and Mauna Kea.

(19) *Xyletobius carpenteri*, sp. nov.

Niger aut fusco-niger, pronoti marginibus aut margine antico saepe rufo, rare pronoto toto rufescente, elytris juxta media utrinque saepe rufonotatis, antennarum articulis duobus aut pluribus basalibus rufis, pedibus colore variantibus, nonnunquam totis rufotestaceis, nonnunquam nigris vel ex parte nigris, maris tamen fere semper pallidis. Caput opacum, subtiliter granulatum, oculis mediocribus, late distantibus, antennis sat elongatis, maris longitudine elytris subaequalibus, feminae  $\frac{2}{3}$  longitudinis elytrorum aequalibus, articulo maris sexto cum sequentibus sat fortiter elongato, feminae



articulo sexto minus elongato, sed praecedente evidenter majore. Pronotum opacum, lateribus dense pallide-tomentosis. Elytra tomento pallido, plus minus lineas longitudinales formante, variegata, leviter striata, stria secunda cum quinta, vel cum stria quadam exteriore, confluyente, et striam tertiam et quartam aut complures alias includente. Long. 3 mm.

Structurally this species is closely allied to *X. beddardi* and others. It is very variable and difficult to describe. The male, as is often the case in the genus, is generally a narrower and more elongate insect than the female though sometimes the sexes closely resemble one another. The pale tomentum of the elytra is nearly always so disposed as to form a number of linear markings; in a few males the surface is so generally covered with pale tomentum or pubescence as to almost obliterate this character. In various parts of the elytra the tomentum is set in different directions, giving it a microscopically roughened appearance, and in some specimens, in consequence of this, there appear to be two well-marked bare red spots near the middle of the wing-cases. This bareness is not real, and many examples show no trace of the red spots. Sometimes there is a good deal of red suffusion of the elytra otherwise. In many specimens a conspicuous patch of pale tomentum is placed on each side of the elytra about the middle of their length. The pronotum is often bordered with red and sometimes entirely red. The legs are variable in colour in the female but in the male are yellow or clear red. The variability seems to affect the species on each island, and even if there is a tendency for the examples from one to vary in a special direction (which is probably true to some extent) yet individuals from each that match each other very well can be picked out without difficulty.

HAB. Lanai, Maui.—Elevations from 1500—5000 ft.; common.

(20) *Xyletobius brunneri*, sp. nov.

Rufofuscus, cinereo- aut aureo-tomentosus, sat elongatus, pedibus flavescentibus, antennarum articulo basali aut rufo aut nigricante, articulo secundo rufo-tincto aut nigro, caeteris articulis nigris. Caput nigricans, antennis ♂ fortiter elongatis, sat serratis, articulo quinto paullo aut haud longiore quam latiore, articulis subapicalibus fortiter elongatis, sed minus gracilibus. Pronotum antice obscurius marginatum, et transversim vel ad medium subdepressum, aureo-tomentosum. Elytra lineis tomenti pallidi conspicue ornata et colore fusco-nigro rufoque plus minus variegata, lateraliter juxta media impressa, parte impressâ rufa, hoc colore nonnunquam ad basim elytrorum extenso. Long. 2.5—3 mm.

I have seen only two males of this species and assign also a single female to it. It belongs to the *X. oculatus* group, not having the distinct anterior margin of the pronotum of *X. nuptus*, some smaller examples of which it greatly resembles, the elytra showing two more distinct red spots on the dorsum towards the middle. The pro-

notum if viewed from the side, has its upper outline a little sinuate, not simply curved or convex. This is due to the lateral impressions extending right across the pronotum, but the character is much less marked than in well-developed specimens of *X. sulcatus*, of which this is so characteristic a feature. The subapical joints of the antennae of the male, though strongly elongate, are not so slender as is usual in males of this group. What I believe to be the female has much shorter antennae, the eighth joint evidently elongate, the two preceding hardly or not at all so.

HAB. Kauai, 4000 ft.

(21) *Xyletobius ashmeadi*, sp. nov.

Niger, plerumque minus dense griseo-tomentosus, elytris ante media rufo-fasciatis, fascia lateraliter elytrorum basim attingente, post media rufo-bimaculatis. Tibiae nigricantes aut piceae. Antennarum articulus secundus (aliique hujus vicini nonnunquam) rufus. Caput subtiliter granulatim sculpturatum, oculis mediocribus, late separatis. Antennae elongatae, maris toto corpore paullo breviores aut saltem elytris evidenter sat longiores, feminae elytris nonnihil breviores, articulo secundo parvo, subgloboso, tertio intus distincte angulato, quarto pro longitudine sequentibus latiore, haud tamen transverso, caeteris versus apices antennarum longitudine accrescentibus, cunctis (praesertim ♂) elongatis. Pronoti latera desuper visa quasi emarginata, pronoto a latere viso supra fere aequaliter convexo. Elytra leviter striata, stria secunda plerumque cum quinta confluenta, et tertiam quartamque includente, haudquaquam cum tertia sola apicaliter conjuncta. Long. 3 mm.

This species is easily recognized by its general appearance. The tomentum is usually more or less flavescent on the red markings of the elytra, and is pretty evenly distributed, so as to give the insect a generally smooth appearance. The five or six terminal joints of the antennae are very elongate, more strongly in the ♂ than in the ♀, and they become more slender towards the apex of the antennae.

HAB. Oahu, 2000 ft.

(22) *Xyletobius blackburni*, sp. nov.

Nigricans aut fusco-niger, capite pronotique lateribus pallide tomentosis, antennarum articulis 2 aut 3 basalibus rufis, tibiis laete testaceis aut rufescentibus, elytris trans basim nigricantibus aut nigro-fuscis, tum fascia transversa pallide tomentosa, post hanc nigricantibus aut nigro-fuscis, apicibus plus minusve pallido tomento ornatis. Caput obscurius granulatum, oculis mediocribus, maris late distantibus, spatio, quod interest, una conjunctis latioribus, antennis sat elongatis, ♂-is elytris longitudine aequalibus, ♀-ae elytris paullo brevioribus, articulis 5 apicalibus sat fortiter elongatis. Pronotum, a latere visum, supra convexum, parum inaequale. Elytra subtiliter striata, stria secunda cum tertia sola apicaliter haud confluenta, sed saepe cum quinta conjuncta, et tertiam quartamque includente. Long. 3 mm.

*X. blackburni* var. *scutellaris* nov.

Elytrorum dimidium basale pallide pubescens, maculam magnam circa scutellum nigricantem includens, post hoc elytra fascia nigricante vel fuscescente irregulari signata, parte apicali pallide tomentosa, plus minus nigro- vel fusco-notata. Pronotum saepius rufescens vel ex parte rufescens.

*X. blackburni* var. *suturalis* nov.

Elytra, ut in praecedenti varietate, fascia nigricante irregulari postmediana ornata, sutura usque ad basim sat late nigricante, vittam longitudinalem cum fascia postmediali conjunctam formante.

*X. blackburni* var. *simplex* nov.

Elytra rufescentia, nonnunquam paullo plus minusve fusco-variegata.

HAB. Oahu, 1500—2000 ft.

(23) *Xyletobius beddardi*, sp. nov.

Nigricans, antennarum articulis 2 basalibus vel compluribus rufis, rarius obscurioribus, elytris basim versus rufo-bimaculatis, maculis rufis sub tomento aureo vel flavescenti abditis, tibiis nigricantibus aut obscuricoloribus. Caput subtiliter densius granulatum, oculis mediocribus, late distantibus. Antennae sat fortiter elongatae, maris, quam elytra, distincte longiores, sed elytris pronotoque una conjunctis haud aequales, feminae, quam elytra evidenter breviores, articulo maris sexto cum sequentibus fortiter elongato, feminae articulis eisdem sat elongatis, maris tamen brevioribus. Pronotum, a latere visum, supra convexum et parum inaequale, haud nitidum, pallide tomentosum. Elytra fortius elongata, subtiliter striata, stria secunda cum tertia sola apicaliter haud confluyente, sed saepe cum quinta vel cum alia exteriori conjuncta, et tertiam quartamque vel complures alias strias includente. Long. 3 mm.

This species is somewhat variable, and sometimes bears a strong superficial resemblance to *X. ashmeadi*. It is, however, a less smooth insect, with a much duller pronotum, unless this be very much rubbed. The red spots towards the base of the elytra are best seen when the elytra are viewed from the apex; in dorsal aspect the tomentum conceals the colour. They vary in size, and, as the yellow tomentum is developed on them, in some examples nearly the whole basal half of the elytra is covered with this tomentum. The latter fades to greyish, and is usually brighter and more extensive in the females. Towards the apex of the elytra a second pair of inconspicuous red spots is sometimes present, the tomentum behind the anterior spots being dark coloured, as also at the apex of the elytra, this dark tomentum being traversed usually by a more or less extensive arc of pallid tomentum, whether the posterior red

spots be present or not. The tibiae are usually all black or dark, the hind ones are always obscured, not clear red or yellow.

HAB. Oahu, widely distributed, found in the Waianae mountains, as well as in the Honolulu range.

(24) *Xyletobius forelii*, sp. nov.

Niger aut nigro-fuscus, pronoto saepius antice rufescente, rarius toto rufo, elytris plerumque ex magna parte rufescentibus, aut rufomaculatis, rarius totis nigris, antennarum articulis duobus basalibus aut pluribus rufis, pedibus omnibus flavescentibus. *X. beddardi* affinis, angustus, pallide tomentosus. Long. 2.5 mm.

I have only seen a small series of this species and the individuals exhibit a good deal of variety. The tomentum is golden or flavescent in fresh examples, fading to whitish. In the reddest specimens the elytra are black only narrowly along the lateral margins, the black colour becoming a little wider near, or a little behind, the middle. In others this dilatation of the lateral dark colour extends inwards to form a transverse band, and the suture becomes dark, dividing the red colour into four spots of variable size. In two examples the elytra are almost entirely dark. The antennae of the ♂ are very elongate, and formed much as in the allied species, being fully as long as, or a little longer than the elytra, the sixth and following joints strongly elongate, the sixth, as usual, being noticeably wider, in proportion to its length, than the ninth or tenth. The tomentum on each side of the suture before the middle of the elytra is very conspicuously disposed transversely to their length, so that the vestiture does not appear very smooth. The legs are always of a clear yellowish colour.

HAB. Oahu, Waianae mountains.

(25) *Xyletobius kirkaldyi*, sp. nov.

Rufescens, angustus, capite nigro vel infuscato, antennis, articulis duobus aut pluribus basalibus exceptis, nigris. Caput minus dense pallide pubescens, dense subtiliter granulatum, opacum. Oculi maris majores, una conjuncti spatio, quod interest, latitudine subaequales. Antennae maris fortiter elongatae, elytris longitudine aequales, aut his nonnihil breviores, articulis sex apicalibus fortiter elongatis, quarto triangulari, vix vel haud longiore quam latiore, quinto elongato; feminae articulo quinto parum elongato, sequentibus, quam maris, evidenter brevioribus. Elytra angusta, elongata, tomento pallido, lineas longitudinales formante, variegata, stria secunda tertiaque ad apices haud confluentibus. Pedibus flavis aut rufescentibus. Long. 3 mm.

Much like *X. carpenteri*, *X. forelii* etc. having the antennae very similarly formed. It does not appear to vary much in general appearance, though sometimes the disc of the pronotum is more or less infuscate and the elytra are, rarely, suffused with black. The female resembles the male in general appearance, but has the eyes much smaller, in

fact of the usual size, whereas the large eyes of the male form the chief distinguishing character of the species. There is evidently a slight variation in the length of the antennae and in some males the eyes are rather larger than in others.

Obs. I do not feel certain that I have correctly determined the sexes of this species. Of supposed females there appear to be only two examples, and one of these is doubtful. It is possible that these really belong to some other species and that some of the specimens that I have considered males are really of the female sex. It is certainly unusual to find only one or two females in a series of about two dozen of a *Xyletobius*. Some examples from Kilauea are very small and ill-developed, others are not different from Maui specimens.

HAB. Maui, Hawaii.—Maui, Haleakala; Hawaii, Kilauea.

(26) *Xyletobius megalops*, sp. nov.

Rufescens, capite nigro, elytris et pronoto nonnunquam plus minusve partim infuscatus, antennis nigricantibus, articulis 3 aut 4 basalibus rufis aut flavidis, haud robustus, sat fortiter elongatus, pallide tomentosus. Antennae fortiter elongatae, maris articulo quinto sat fortiter elongato, sexto fere bis longiore quam latiore, septimo quam praecedente longiore, caeteris gracilibus, fortiter elongatis. Oculi maris permagni, capite a fronte viso singuli spatio, quod interest, haud minus lati. Oculi feminae late separati, una conjuncti spatio, quod interest, vix latitudine aequales. Pronotum latum, lateribus densius pallide tomentosis. Elytra fortiter elongata, lineis tomenti pallidi variegata, striis minus conspicue sinuatis. Long. 3.5 mm.

Allied to *X. kirkaldyi*, but readily distinguished by the still much larger eyes of the male. Whether Blackburn's *X. insignis* is allied more closely to this species or the one just mentioned I do not know. Its antennae are different in colour from those of any specimen I have seen of either, and the eyes I should judge from the description to be very likely intermediate in size, perhaps more like the following (*X. euops*). The female of *X. megalops* is very like the male in the antennal structure, but its eyes are much more widely separated and smaller, though a good deal larger than is usual in the genus.

HAB. Lanai, 2000 ft., near Koele.

(27) *Xyletobius euops*, sp. nov.

*X. megalopi* affinis, sed minor et oculis minoribus distinguendus. Long. 2.5 mm.

I have seen only two examples of this species and cannot decide whether they represent the sexes or not. They are alike in all respects except that the eyes of the one are decidedly larger than those of the other. In the type the eyes (in a front view of the face) are together wider than the space (where narrowest) between them,

in the other example they are slightly smaller. They are clearly closer together than in *X. kirkaldyi*, just as they are clearly wider apart than those of *X. megalops*. I should think they represent a distinct species.

HAB. Oahu.—The type specimen was taken in the Honolulu range at an elevation of somewhat less than 2000 ft. I have since procured the second (mentioned above) some fifteen miles from the original locality.

(28) *Xyletobius insignis* Blackburn.

*Xyletobius insignis* Blackburn, Tr. Dublin Soc. 1885, p. 158.

Blackburn's diagnosis is as follows: "Angustus; dense subtilissime tomentosus; capite nigro, ore prothoraceque rufis; elytris piceis testaceo-variegatis subtiliter striatis, striis plus minusve sinuatis; antennis (toto corpore vix brevioribus), palpis, pedibusque rufis; oculis permagnis. Long. 5 mm."

Blackburn, in his further remarks, adds that "the antennae are entirely of a pale red colour." Though this latter character of itself would not be sufficient to define a species, since several *Xyletobius* present this colour of the antennae as a variation, still I do not feel justified in considering *X. insignis* as identical with either my *X. euops* or *X. megalops* without actual comparison of the types.

HAB. Hawaii, Kilauea (Blackburn) unique.

(29) *Xyletobius euphorbiae*, sp. nov.

Oblongus, sat robustus, fusco-niger aut fuscus, partibus nonnunquam rufescentibus, pedibus antennarumque 2 aut 3 articulis basalibus flavidis aut rubris, dense tomentosus. Caput dense pallide tomentosum, oculis latissime separatis, antennis brevibus, articulo sexto et sequentibus haud aut parum elongatis. Pronotum, desuper visum, haud quasi fortiter utrinque excisum, disco brunneo- aut fusco-tomentoso, lateribus dense pallide tomentosus. Elytra latiora, breviuscula, tomento nigro, fuscoque vestita, fascia tomenti cinerei valde curvata aut angulata juxta media elytra suturam attingente, post media fascia secunda transversa cinerea, et post hanc saepius fascia, plus minus distincta, flavescens, interstitiis apices versus convexiusculis. Long. 3.5 mm.

This species is very distinct in appearance from any excepting *X. cyphus*, and does not vary sufficiently to present any difficulty in determination. Its transversely banded elytra, the tomentum forming three or four dark and two or three pale bands, are characteristic. Probably the pale tomentum should be considered the ground colour, and the bands are due to longitudinal apposed markings of dark tomentum on the interstices. The latter are a little raised or convex towards their apices. The granulation of the pronotum is very noticeable along the hind margin.

I have examined a good series of this species, but nearly all of these were bred

from a small piece of dead *Euphorbia*, brought down from Mauna Loa on Hawaii. Single examples only were collected on Oahu and Lanai. No doubt it is on all the islands, excepting possibly Kauai.

HAB. Oahu, Lanai, Hawaii.—Hawaii, Mauna Loa.

(30) *Xyletobius cyphus*, sp. nov.

*X. euphorbiae* cognatus, forma, colore et vestitu simillimus, pronoti structura distinctissimus. Pronotum medium nigro-bimaculatum, subbituberculatum, a latere visum haud supra simpliciter convexum sed juxta medium evidenter angulatum. Long. 3.5 mm.

I have seen but one example of this species, which superficially is identical with *X. euphorbiae*. The pronotum, however, is quite differently formed, being strongly raised about the middle, so as even to have a bituberculate appearance; in profile the outline is not an almost simple curve as in *euphorbiae* but the front and posterior half meet at a very distinct angle. The unique specimen had been badly handled in mounting, and its antennae were broken off, but portions of these were found stuck on the ventral surface and, when removed, were found to be similar to those of *X. euphorbiae*.

HAB. Oahu, above 2000 ft., 1892.

(31) *Xyletobius monas*, sp. nov.

Nigricans, plus minus rufo-tinctus, antennarum articulo secundo, tarsisque pallidis, tomento nigricante, aureo-micante vestitus, apices versus elytrorum fascia tomenti pallidi transversa ornatus. Antennae sat breves. Long. 4 mm.

Allied to *X. euphorbiae*, which it resembles in shape and in the subconvex termination of the inner interstices of the elytra. Tenth and ninth antennal joints longer than broad, but not at all strongly elongate in the unique specimen, which is probably a male. Owing to the arrangement of the dark tomentum and irregularities of the surface a number of deep black spots are seen in dorsal aspect of the thorax and elytra. The tomentum has a dark golden or coppery sheen in certain lights. The subapical fascia on the elytra is interrupted by the suture and is very conspicuous, being formed of yellowish tomentum, the surface itself beneath the fascia being pale.

HAB. Maui; one example in the West Maui mountains above 2000 ft.

(32) *Xyletobius nigrinus* Sharp.

*Xyletobius nigrinus* Sharp, Tr. Ent. Soc. London, 1881, p. 518.

I have not met with this species, which appears to be very distinct.

HAB. Maui, Haleakala, 5000 ft. (Blackburn).

(33) *Xyletobius nudus*, sp. nov.

Niger, haud robustus, antennis pedibusque nigris, subtilissime, parum conspicue, cinereo-tomentosus. Caput parum pubescens, dense subtilissime sculpturatum, antennis longitudine mediocribus, fortiter intus serratis, articulis 3, 4, 5 et 6 transversis, aut saltem haud longioribus quam latioribus, 7 et 8 fere aequae latis ac longis aut paullulo elongatis, 9 et 10 sat conspicue longioribus quam latioribus. Pronotum subnitidum, laeve, subtilissime punctulatum, subtilissime nec dense tomentosum, fortiter transversum, antice distincte marginatum. Elytra subtiliter striata, striis fere impunctatis, distincte sinuatis, interstitiis crebre rugulosis, stria secunda cum tertia ad apices confluenta, tomento albido minus conspicuo, sculpturam elytrorum haud celante. Long. 4 mm.

I think this species must be closely allied to *X. nigrinus* Sharp, which I have not examined, but it does not agree in detail with Dr Sharp's full description of that species, and is, I should think, clearly distinct. It is not closely allied to any other known to me. I have seen only the type (which I believe to be a male) and one other example. The latter has the pronotum less strongly transverse and more produced in the middle in front, but is clearly the same species, agreeing in other respects with the type.

HAB. Kauai; 3000 and 4000 ft.

(34) *Xyletobius speiseri*, sp. nov.

Fuscus, antennis fusco-testaceis sive brunneis, pedibus brunneo-testaceis, ubique aequaliter tomentosus. Caput dense tomentosum, antennis brevibus, articulis 3 anteapicalibus minus fortiter elongatis, haud bis longioribus quam latioribus. Oculi majores, sed late distantes. Pronotum latum, plaga dorsali dense aequaliter brunneo-tomentosa, hac plaga utrinque albido-marginata, latera versus cinereo-tomentosum. Elytra utrinque sat evidenter compressa, plagâ brunneâ dorsali magnâ subtriangulari (sive postice attenuatâ) post mediam suturam extensâ, utrinque albomarginatâ, ornata, apicibus latius aureo-brunneis, partibus caeteris cinereo-tomentosis, stria secunda cum tertia sola haud confluenta. Long. vix 5 mm.

I have seen only one example of this species, probably a male. It was taken at light. It is allied only to *X. collingei*, but is very distinct.

HAB. Kauai, 4000 ft.

(35) *Xyletobius collingei*, sp. nov.

Fusco-niger aut fusco-rufus, antennis nigricantibus, articulis basalibus haud, aut parum distincte, rufescentibus. Antennae conspicue breves, articulis intermediis haud, apicalibus minus fortiter, elongatis. Pronotum dense granulatim sculpturatum, peropacum, tomento fusco-pallido aut pallido vestitum, maculis compluribus, plus minus distinctis, quasi nudioribus signatum. Elytra albido-tomentosa, plagâ dorsali permagnâ,



postice attenuatâ (sive forma subtriangulari), a basi post media elytra extensâ, colore variabili, sive atro-brunneo sive brunneo-aureo, ornata. Long. 4.5 mm.

This pretty species is closely allied to *X. speiseri*, from which it can be distinguished at a glance by the fact that the remarkable pattern on the elytra is not continued on to the pronotum. In addition to the great brown or golden area, which extends from the base of the elytra, there is generally more or less trace of a subapical band or spot and sometimes the surface is noticeably red in that position. In one specimen the whole elytra appear clothed with uniform whitish tomentum, the pattern having entirely disappeared. This is no doubt due to long exposure, and such specimens would be entirely robbed of their most characteristic appearance.

HAB. Hawaii, Kilauea. I took several examples in 1906, but had never met with it previously. It occurs close to the Volcano house hotel and is attached to *Cheirodendron*, in the bark of which I found it ovipositing. The type is with those of the other species collected by me.

(36) *Xyletobius sharpi*, sp. nov.

Niger, antennarum nonnullis subbasalibus articulis saepius flavescentibus aut rufis, rare omnibus nigris. Corpus minus dense subtilissime albido-tomentosum, pronoto postice macula utrinque rotundata tomenti conspicue flavescentis ornato, elytris ante media fasciâ ejusdem coloris tomentosâ conspicue signatis. Antennae ♀ breves, maris minus fortiter elongatae, articulo 6 et 7 hujus haud fortiter, illius haudquaquam elongatis. Elytra hinc illic leviter sed distincte impressa, distincte striata, stria secunda cum tertia sola ad apices confluenta (rare ambarum apicibus liberis). Long. 4 mm.

It is impossible to confuse this remarkable species with any other described form. It belongs to the group of *X. fraternus* and *simoni*. The type specimen alone of the four or five examined appears to be a male and it differs a good deal in the pronotum from the others, this part in dorsal aspect having an appearance of strong lateral emargination. In the females this false emargination is slight or appears only as a light inward sinuation of the lateral outline. I suspect the ♂ is abnormal in this respect. It was taken in company with one of the females.

HAB. Oahu, about 1500 ft. in the Koolau range, and also in the Waianae mountains.

(37) *Xyletobius simoni*, sp. nov.

Niger, antennis colore variabilibus, nigris, fuscis, flavescentibus, aut articulis nonnullis basalibus rufescentibus, caeteris nigris. Elytra fere aequaliter cinereo- aut flavido-tomentosa, plaga circum scutellum magna picea aut nigra, post hanc fascia flavescente, lateribus dilatatis et ad humeros extensis, ornata, post fasciam nigra aut nigrescentia, maculis duabus flavescentibus plerumque magnis signata. Caput parum

dense vestitum, antennis brevibus, articulis 7, 8 et 9 vel in mare minus elongatis. Pronotum minus transversum, medium subtilissime punctatum, haudquaquam granulatum, circa marginem posteriorem etiam densissime punctulatum. Striae elytrorum parum sinuatae, apicibus indistinctis plerumque aut obsoletis. Long. 3.5 mm.

A black species with conspicuously yellow-marked elytra, resembling *X. ashmeadi* in appearance. The smooth and uniform covering of tomentum, together with the colour, the very short antennae, and smooth, finely punctate pronotum readily distinguish it from any others. A short series examined.

HAB. Oahu, in both ranges, but chiefly from the Koolau or Honolulu range.

(38) *Xyletobius fraternus*, sp. nov.

Niger, antennis flavescentibus, articulis primo et ultimo fuscis aut nigris, nonnunquam compluribus aliis etiam infuscatis, pedibus plerumque ex magna parte nigricantibus aut piceis, elytris plaga vel macula magna basali utrinque flavida aut rufa ornatis. Corpus totum tomento pallido quasi lanoso vestitum, haudquaquam laevigatim disposito. Antennae breves, articulis 7, 8 et 9 haud fortiter elongatis. Pronotum supra laeve, subtilissime punctulatum, haud granulatum, minus transversum. Long. 3.75 mm.

Very similar to *X. simoni*, but with the minute hairs, forming the tomentum, very irregular in disposition, giving the clothing a woolly appearance. The tomentum is white, but on the basal red or yellow marks of the elytra it becomes yellowish and again tends to form two yellowish spots near the apex. The yellow subapical spots or markings so conspicuous in *X. simoni* are altogether absent or very indistinct.

*Xyletobius fraternus* var. *laetior* nov.

A single example in my collection from the Honolulu range of mountains is clearly a local race of the above and may conveniently be given a name. It combines with the woolly vestiture of *X. fraternus* the more extensive yellow markings of *X. simoni*, the flavescient tomentum of the anterior pale markings being connected along the suture with the large posterior yellow patches, so that only a small area remains which is covered with white tomentum. Antennae clear yellow, the basal and apical joints dark and the subapical ones subinfuscate. Tibiae yellow or red, much lighter than in the type.

HAB. Oahu, Waianae mountains (typical); the variety, Honolulu range.

(39) *Xyletobius roridus*, sp. nov.

Niger, elytris post basim transverse rufofasciatis, fascia ad latera dilatata, apices versus rufo-bimaculatis, his maculis, fasciaque et pronoto tomento haud laevi, cinereo conspicue vestitis, caeteris partibus elytrorum parum evidenter tomentosis. Antennae

breves, articulis 2 aut compluribus basalibus rufis. *X. fraterno* persimilis et affinis, pronoto haud simpliciter punctulato sed subtiliter sat distincte granulatim sculpturato bene distinctus. Long. 3.5 mm.

The coarser tomentum is confined to the pale elytral markings and covers the pronotum except apparently for a nearly bare median longitudinal line (whereon the fine granular sculpture is evident). It is of a somewhat woolly appearance as in *X. fraternus*. Though so like the allied forms I have little doubt *X. roridus* is a distinct species. I have seen only two examples.

HAB. Oahu, Waianae mountains.

(40) *Xyletobius sykesii*, sp. nov.

Statura minore, angustus, elongatus, elytris subfortiter inaequalibus, tomento quasi irregulariter vestitis, nigricans, thorace et nonnunquam aliis partibus piceis aut rufotinctis, antennarum articulis nonnullis basalibus rufescentibus, pedibus pallidis, rufis aut flavis. Oculi minores. Antennae sat breves, articulo sexto et sequentibus parum fortiter (♂) aut haud elongatis. Pronotum quasi irregulariter aureo- aut argenteo-tomentosum desuper inspecto, margine antico juxta angulos laterales nonnihil utrinque prominulo. Elytra angusta, conspicue quasi irregulariter tomento saepius fusco, aureo-nitente, vestita, post apicem striae primae suturam juxta plerumque subfoveata. Long. 2.75—3.25 mm.

In its typical condition this species is very characteristic, by its narrow form, golden clad thorax, and dark tomentum of the elytra, which shines in certain lights with golden or other bright reflections. This tomentum, owing to the irregularities of the surface of the elytra, appears to leave bare spots, the shape and appearance of which change in different aspects of the insect. In some examples the elytra have golden tomentum, that on the thorax being then still paler or silvery.

*Xyletobius sykesii* var. *molokaiensis* nov.

Formae typicae persimilis, sed plerumque brevior, pronoto compluribus impressionibus fortioribus signato, distinguendus.

This should perhaps be considered as a distinct race or subspecies rather than a mere variety. The tomentum though variable in depth of colour is for the most part similar on the pronotum and elytra, being golden or silvery or golden-fuscos.

HAB. Oahu, Molokai, Lanai, Maui, Hawaii.—The type form is from Hawaii. Usually not common. I have seen 40 or more specimens mostly from Hawaii.

(41) *Xyletobius praeceps*, sp. nov.

Niger aut fusco-niger, pedibus antennarumque articulis 3 basalibus aut compluribus rufescentibus aut flavescentibus. Caput albido-tomentosum, antennis brevibus, articulis 4—9 latis. Pronotum, desuper visum, medium nigro-fusco-tomentosum, lateribus dense albido-tomentosis, margine antico versus angulos laterales sat fortiter (nonnunquam angulariter) explanato sive prominente. Elytra nigro-fusco-tomentosa, hinc illic plus minus ferrugineo- aut aureo-nitentia, lateribus tomento argenteo (plus minus aureo commixto) vestitis. Long. 3.5 mm.

Evidently allied to *X. sykesii* and its allies, the elytra shorter than in most of these and less uneven. Tomentum for the most part dark fuscous with golden or ferruginous reflections, but silver or mixed silvery and golden on the sides of the pronotum and of the elytra. Pronotum angulate at the sides or almost so, in dorsal aspect, owing to the anterior margin being explanate before attaining the lateral angles.

I have seen but two examples taken together in June 1896, one of which is more slender and only half the bulk of the other, though probably both are females. They are obviously of the same species and otherwise differ very little except in minute details of vestiture. The pronotum is much smoother and the colour of the clothing utterly unlike that of *X. sykesii molokaiensis*, which is found in the same locality, while the elytra also are not conspicuously impressed.

HAB. Molokai, about 3000 ft.

(42) *Xyletobius mundus*, sp. nov.

Brunneo- sive fusco-niger, capite cinereo-tomentoso, pronoto elytrisque tomento simili fusco, aureo-micante, vestitis, horum lateribus dense argenteo-tomentosis, pedibus flavis, antennis articulis nonnullis basalibus rufescentibus. Long. 3 mm.

Evidently closely allied to *X. sykesii*, but very different in superficial appearance from the dark fuscous tomentum on the pronotum, resembling that on the elytra and the other differences in the latter, as noted in the diagnosis. The anterior margin of the pronotum near the lateral angles is strongly prominently rounded or explanate, of the same general form as that of *X. sykesii*. The three or four joints preceding the terminal one of the antennae are more elongate than in any examples of that species. It is however possible that it may prove a local form of *X. sykesii*, although that insect in its typical condition or in one rather approaching the var. *molokaiensis* is found on Oahu.

HAB. Oahu, about 2000 ft. One example only taken.

(43) *Xyletobius aurifer*, sp. nov.

Piceus aut fusco-niger, antennarum articulis basalibus pedibusque flavis aut rufescentibus. *X. sykesii* affinis, sed minus angustus, elytris pronotoque tomento aureo concolori vestitis, illis minus fortiter impressis distinguendus. Long. 3 mm.

Shorter and wider than *X. sykesii* (typical), the pronotum much less uneven than in the var. *molokaiensis*, the clothing of tomentum more uniform in colour, this form is at present to be regarded as a distinct species. Nevertheless future observations may prove it to be no more than a constantly occurring variation of *X. sykesii*, some examples of which evidently approach it more closely than others.

HAB. Hawaii, Kilauea.

(44) *Xyletobius chryseis*, sp. nov.

Parvus, elongatus, angustus, dense aureo et fusco-aureo tomento vestitus, pedibus antennarumque articulis basalibus flavis aut rufis, antennis brevibus. Margo pronoti, desuper visi, anticus juxta angulos laterales fortius prominulus sive explanatus. Elytris minus fortiter inaequalibus. Long. 2.5 mm.

Closely allied to *X. sykesii* but smaller, the surface less uneven and consequently appearing more regularly clothed. Pronotum in dorsal aspect with the front margin rather strongly prominent or explanate at the sides. The tomentose covering is more like *X. aurifer* than that of *sykesii*, but the former is at once separated by its much wider form.

HAB. Oahu, Waianae mountains, about 2000 ft. I have only seen half a dozen examples, obtained together and showing no variation.

(45) *Xyletobius scotti*, sp. nov.

*X. sikesii* subsimilis, angustus, parvus, tomento argenteo aut pallide aureo vestitus, nigricans aut fusco-niger, pedibus pallidis, flavescentibus, antennarum 2 aut 3 articulis basalibus flavis aut rufis, pronoto antice, nonnunquam etiam postice, rufescente, elytris juxta humeros supra rufomaculatis. Antennae sat breves, articulo sexto et sequentibus aut transversis aut parum elongatis (maris quam feminae paullo longioribus). Pronotum, desuper adspectum, fere simplex, lateribus levissime concavis, haud subfortiter quasi excisis, margine antico versus angulos laterales haud evidenter prominulo sive explanato. Elytra et pronotum tomento fere simili colore vestita. Long. 3 mm.

The tomentum on the elytra, as in *X. sikesii* and its allies, is conspicuously irregular, some of the short hairs of which it is composed being directed transversely inwards, some outwards, while some are longitudinal in direction, some of the striae a good deal sinuate at the elytral impressions. The species is quite distinct from any of

these by the more regular pronotal outline laterally, as described above. The single example from Molokai has the tomentum pale golden, rather than silvery, but otherwise seems identical with three examples from Hawaii, which show no noticeable variation. With these, however, was taken an example of a uniformly brown colour, which may be known as var. *castaneus*.

HAB. Molokai, Hawaii.—Hawaii, Kilauea, Molokai, 3000 ft.

(46) *Xyletobius flosculus*, sp. nov.

Parvulus, angustus, rufescens, capite nigricante, pedibus antennarumque articulis 2 basalibus aut compluribus pallidis, totus aureo tomento aequaliter et laeve vestitus, antennis brevibus. *X. chryseidi* cognatissimus. Long. 2.5 mm.

Allied to *X. chryseis*, but readily distinguished by the very uniformly distributed pale golden pubescence, the surface of the elytra being smooth, the tomentum not at all rough or shaggy. Elytral striae invisible in perfectly fresh examples, the tomentum concealing them. Pronotum formed as in *X. chryseis* and allies, the front margin towards the sides a little produced or with a rounded explanation in dorsal aspect.

HAB. Hawaii, Kilauea; a single example taken on each of three occasions.

(47) *Xyletobius stebbingi*, sp. nov.

Minus fortiter angustus, parvulus, niger, dense tomento argenteo aut pallide aureo ubique vestitus, antennis sat brevibus, articulis basalibus pedibusque rubris. Pronotum dense tomentosum, medium postice plaga quasi nuda magna nigricante signatum, margine antico versus angulos laterales haudquaquam explanatim prominulo. Elytra peraequaliter tomentosa, haudquaquam variegata, leviter striata, striis parum fortiter sinuatis. Long. 3 mm.

Remarkable amongst the species with short antennae for the very uniform and regular clothing of the elytra, on which the tomentum lies in a very even manner, and is neither variegate from differences in colour of the clothing, nor from inequalities of the surface. The pronotum is of a simple form, not appearing excised laterally as in the *X. sykesii* group, nor with the front margin laterally prominent in dorsal aspect. Three examples taken.

*Xyletobius stebbingi* var. *notatus* nov.

Paullo major, elytris circa aut post media plus minusve fuscescentibus.

I have seen four examples taken on Molokai, which I refer to this species as a local race or variety. They are not in very good condition, but the tomentum of the elytra is generally slightly darker in tint than in the type form and near or behind the middle

there is a more or less distinct fuscous band or marking, caused by a change of colour in the tomentum. A specimen with rufescent elytra taken with the others is also clearly the same species.

HAB. Molokai, Hawaii.—Hawaii, Kilauea; Molokai, 3000 ft., the variety.

(48) *Xyletobius lineatus* Sharp.

*Xyletobius lineatus* Sharp, Tr. Dublin Soc. 1885, p. 159.

This species, if I am correct in my identification, is one of the most abundant of all *Xyletobius* and very variable in colour. It is particularly abundant on the uplands of Hawaii, but occurs on all the islands. On Maui only a few examples were collected and hardly any I think on Lanai or Molokai, but the specimens from these three islands were so roughly handled in mounting by not very skilled workers, as to be spoiled for practical purposes. From Oahu and Kauai good specimens were available.

Specimens from the West side of Hawaii at elevations of 3000—5000 ft. or more are generally darker than those from 4000 ft. on the other side. Four individuals in 120 examined from the former locality are entirely black, while from the other side only one in over 1500 is of this variety. It is convenient to name this melanochoic form:

*X. lineatus* var. *holomelas* nov.

Niger, antennis pedibusque nigris.

Another very distinct form has the elytra black and is broadly red on the apical portion and may be called var. *apicalis*.

*X. lineatus* var. *apicalis* nov.

Elytris nigris aut nigricantibus, apicibus late longeque rufis, ibique pallide tomentosis.

This variety was rarer on the West side, only two examples in 120 examined were discovered. From the other side 1100 were counted, one in twenty being var. *apicalis*.

On Oahu most of the examples were very small and narrow, but some occurred with these that were inseparable from some individuals taken on Hawaii and others on Kauai. No var. *apicalis* was found.

Some of the Kauai specimens were large and with a tendency to greater elongation of the antennae, some identical with those from Maui and Oahu.

The species as a whole is excessively close to *X. lasiodes* and the latter may be only a race or variety, yet the different character of the pubescence or tomentum on the elytra readily separates the two, unless it be in very exceptional cases. The variation of the two forms is very different.

One other very remarkable variety I was for some time inclined to consider of specific rank, but I have since found it to be connected with the typical form. I here-with diagnose it as follows :

*X. lineatus* var. *humeralis* nov.

Niger, elytris nigris, nigro aut fusco-nigro tomento vestitis, utrinque macula magna rufa humerali fere ad suturam extensa et plagam circumscutellarem nigram includente, conspicue ornatis, his maculis rufis pulchre aureo-tomentosis, parte apicali elytrorum nigra saepe paullo tomento pallido variegata.

HAB. Kauai, Oahu, Maui, Molokai, Lanai, Hawaii.—From 1500 ft. to 6000 ft. above sea-level.

(49) *Xyletobius serricornis* Blackburn.

*Xyletobius serricornis* Blackb., Tr. Dublin Soc. 1885, p. 159.

This will probably prove to have been described by me under another name, unless, as is quite likely, it is a variety of *X. lineatus*, perhaps the other sex. *X. lasiodes* is, doubtless, common on Lanai, and it may be one of the forms of that very variable species. Except that *X. serricornis* is said to have the antennal joints more serrate, I see nothing in Blackburn's description to separate this from *X. lineatus*, as described by Sharp.

HAB. Lanai (Blackburn).

(50) *Xyletobius lasiodes*, sp. nov.

Niger, aut rufescens, aut particolor, pedibus flavis aut rufis, antennarum articulis basalibus 2 aut compluribus basalibus rufis aut flavis, caeteris nigris aut nigrofusis. Antennae breves, ut in *X. lineato* formatae. Pronotum dense aureo aut argenteo tomento vestitum, margine antico, desuper viso, simpliciter rotundato, haud angulos versus laterales prominulo, a latere visum supra simpliciter sat distincte curvatum sive convexum. Elytra dense conspicue aureo aut pallido tomento vestita, hoc parum evidenter lineas pallidas formante, nec levissimo. Long. 2.75 mm.

Differs from *X. lineatus* Sh. in the conspicuously rougher tomentum, showing little tendency to form distinct pale lines on the elytra. Specimens from Lanai are sometimes very large and with rather more developed antennae. There is a var. *apicalis* corresponding not to the var. *apicalis* of *X. lineatus*, but to that of *X. sulcatus*, the apical red colour being deeply excised in front. When the elytra are entirely red this *apicalis* variety may still occur, the apical red colour being paler than the other.

HAB. Oahu, Lanai and no doubt also on the other intermediate islands.—Common and widely distributed, occurring close to Honolulu and in all other localities on Oahu.



(51) *Xyletobius sulcatus*, sp. nov.

Rufescens, plerumque plus minus nigro- aut fusco-variegatus, aut niger plerumque plus minus rufo-variegatus, antennis nigris aut nigrofuscis articulis 2 aut pluribus basalibus rufis, pedibus rufis aut flavis, conspicue pallide tomentosis. Antennae ♂ breviores, articulis subapicalibus elongatis, sed latioribus, haud gracillimis. Pronotum latum, antice transversim conspicue impressum, a latere visum supra sinuatum, haud simpliciter convexum, pallide tomentosum. Elytra plerumque tomento albido aut aureo variegata, saepe rufescentia et circum suturam plus minus nigricantia aut infuscata, rare nigra aut fere nigra, saepe fere tota rufescentia aut rufa, lineatim plus minus infuscata. Long. 3 mm.

*X. sulcatus* var. *apicalis* nov.

Elytris nigris, supra tomento nigro aut nigro-fusco vestitis, apicibus rufis.

This very variable species is allied to *X. lasiodes*, but is easily distinguished by the transversely impressed front portion of the pronotum. This impression itself varies in strength and distinctness, but is always apparent. Otherwise, apart from colour, there is some variation in the development of the antennae, which are rather longer in some examples than in others, especially in the males.

HAB. Kauai, 2000—4000 ft.; common and probably ubiquitous in suitable parts of this island.

(52) *Xyletobius hawaiiensis*, sp. nov.

Sordide rufo-fuscus, antennis pedibusque nigricantibus, sat dense pallide tomentosus, *X. walsinghamii* v. *minor* affinis. Pronotum perinaequale, medium fortiter elevatum, marginibus ante angulos posteriores levissime concavis. Elytrorum interstitia convexiuscula, stria 2 et 3 ad apices confluentibus. Long. 4 mm.

This species is described from a single specimen, which having been smeared all over with gum was not recognized as distinct, till after I had completed my manuscript of the genus. It is nearest to *X. walsinghamii* var. *minor*, next to which it should be placed, and from which it is readily distinguished by its much smaller size and black legs and antennae.

HAB. Hawaii, Kona, 2000 ft.

ANOBIUM.

*Anobium paniceum* L.

HAB. Oahu and probably the other islands.

## LASIODERMA.

*Lasioderma serricorne* F.

HAB. Hawaiian islands, generally distributed and injurious.

## CATORAMA.

(1) *Catorama mexicana* Chev.

HAB. Oahu, Maui, Hawaii and no doubt the other islands.

(2) *Catorama pusilla* Sharp.

*Catorama pusilla* Sharp, Tr. Dublin Soc. 1885, p. 160.

HAB. Maui (Blackburn). I do not remember having noticed this species, but I paid very little attention to the introduced Anobiids of which there are other species now present in Honolulu.

## MIROSTERNUS Sharp.

*Mirosternus* Sharp, Tr. Ent. Soc. London, 1881, p. 526.

The species of this genus, which, though described originally from Hawaiian specimens, is also found in the central parts of America, are numerous in the islands and extremely difficult to distinguish from one another. They are also very difficult to expand for purposes of examination, and are, unless the greatest care is taken, very easily damaged in the process. No doubt, with specimens recently captured this difficulty would be comparatively slight, but in the case of those kept in carbolized boxes for years before manipulation it is extreme.

The four most important characters are (1) the size of the eyes, (2) the form of the antennae, (3) the structure of the metasternum, (4) the general sculpture and clothing. Each of these characters is unfortunately subject to vary both individually and according to sex. Thus the eyes may be nearly the same size in both male and female of a species or entirely different; a carina may be well-developed on the metasternum of the ♂, and feeble or absent in the ♀, and the antennae may be nearly alike in both sexes or very different, according to the species; so too, the puncturation varies sexually and individually.

I herewith have made some attempt to group the species on the first and last of the above mentioned characters, but such grouping is not altogether natural. It is so to a considerable extent, in that many evidently allied species fall naturally together and it may serve, though very imperfectly, for the more ready discrimination of the species. It is based essentially on male characters and often will not be correct for examples of the female sex.

I. Eyes always of enormous size at least in the ♂, the width of one of these never less than the space, where least, between them, and often very much wider than this space

- (a) Species chiefly testaceous or ferruginous in colour.....*M. oculatus*, *testaceus*, *punctatissimus*, *excelsior*, *pyrophilus*, *basalis*.
- (b) Species black, dark brown, or piceous.....*M. sordidus*, *hawaiiensis*, *frigidus*, *epichrysus*, *duplex* (♀ with small eyes), *lanaiensis*.

II. Eyes rarely so large that the width of one in the ♂ is subequal to the space, where least, between them, usually widely separated and often of comparatively small or moderate size (*M. muticus* ♂, *discolor* ♂ and a few others approach *M. lanaiensis* in the size of the eyes, so that there is no abrupt division between these sections and *M. nigrocastaneus* should perhaps be placed in the first, though I have included it in Div. II.).

(1) Elytra above (i.e. not considering the deflexed lateral parts) always with an extremely sparsely punctured, glabrous, or almost bare area on the more basal part at least, sometimes with the whole or almost the whole surface glabrous or nearly and extremely few punctures, or in a condition intermediate between these extremes; surface of the glabrous or subglabrous part usually polished, rarely dull and with fine rugulosity, the very remote punctures of the glabrous portion often of rather large size (compared with parts densely punctured) and feebly impressed.

(a) Elytra either with no dense puncturation or only so punctured more or less narrowly along the suture or on the basal margin or on both basal and sutural margins.

(a') Basal joint of the antennal club, at least in the ♂, of unusual form, elongate and very narrow.....*M. kauaiensis*, *molokaiensis*, and *ignotus*.

(b') Insects brightly marked black and yellow.....*M. xanthostictus* and *bicolor*.

(c') Species not as in (a') and (b').....*M. affinis*, *montanus*, *rugipennis*, *simplex*, *denudatus*, *latifrons*, *irregularis*, *maurus*, *laevis*, *fractus*, *parvulus*, *eutheorus*, *nigrocastaneus*, *angulatus*, *pallidicornis*, *glabripennis*, *peles*.

(b) Elytra with an extremely dense puncturation on the apical portion, extending far outwards from the suture, sometimes to the lateral margins.

(a') Elytra with excessively minute whitish tomentum on the apical portion, in front of this with a patch or band of coarser yellow or golden pubescence.....*M. blackburni*, *blackburnioides*.

(b') Elytra not so clothed.....*M. sculptus*, *varicolor*, *lugubris*, *pusillus*, *parcus*, *subparcus*, *amatus*, *cognatus*, *konanus*, *hypocoelus*.

(2) Elytra above without a glabrous and extremely sparsely punctured area near the base, sometimes densely punctured all over, or all but a space along the lateral margins, and often nearly evenly pubescent all over. In some species the punctures are noticeably less dense on the part between the densely punctured apical part and the extreme base, but the punctures are never extremely sparse and remote. Sometimes the puncturation, though sufficiently dense, is shallow and indefinite.

(a) Antennal club large in the ♂ or with the first or first and second joints in some aspects subquadrangular.....*M. eximius*, *solitarius*, *punctatus* (?), *amaurodes*, *elongatulus*, *discolor*, *muticus*, *carinatus*, *acutus* (?), *lugubris* var., *plebeius*, *dubiosus*, *tetragonus*, *rufescens*, *marginatus*.

(b) Antennal club moderate or small, or with the basal joint unusually elongate for its width.....*M. tristis*, *vestitus*, *varius*, *debilis*, *hirsutulus*, *stenarthrus*, *dimidiatus*, *obscurus*, *solidus*.

In this table the species likely to cause most difficulty are (*a*) those in which the eyes are unusually large, but not so greatly developed as those in section I; species most likely to cause difficulty are *M. nigrocastaneus* and *M. discolor*, which might almost be placed in the first division: (*b*) species in which the puncturation is of a feeble and indefinite character or variable, e.g. *M. maurus*, *lugubris*, *varius*, *discolor* and a few others, which, either from individual variation, or from ill-definition of the sculpture, it is hard to tell whether to refer to (1) I or to I (2). Fortunately these difficult forms are, when all told, comparatively few. The pubescence is of great value in deciding the position of a species, for when it is markedly distinct immediately along the suture behind the base of the elytra and very scanty external to this, such a form will be placed under I (1); when fairly regular in distribution, even though not at all dense, the species so clothed will fall under I (2). Unfortunately the clothing is subject to abrasion, when the antennae are being extracted, and this abrasion usually occurs a little behind the base, in fact on the most critical part of the insect. In these cases most careful examination of the puncturation is necessary. If the punctures are very few and of unusually large size and very shallow, the species should be placed in I (1). Species like *M. debilis* (or at least examples that I refer to *debilis*) clearly belong to I (2); so too does *M. lugubris* ♂, though I have placed it under both sections, since it varies in sculpture.

Although I have obtained a good many *Mirosternus* in various localities since I ceased to collect for the Sandwich Islands Committee, I have (with one exception) not considered these specimens in the present paper. I have been much struck with the entire absence of distinct new forms in those recently collected, and, I may say, that so far from throwing light on the species here described, these later specimens will greatly increase the difficulty of distinguishing the species, there being either a number of new species excessively closely allied to those here described, or forming variations of a most perplexing nature.

(1) *Mirosternus oculatus*, sp. nov.

Ferrugineus aut testaceus, oblongus, capite et pronoto nonnunquam sordidioribus, antennarum clava nigricante aut fuscescente. Oculi permagni, singulis spatio frontis intermedio duplo latioribus. Antennarum clava permagna, articulo primo triangulari, angulo interno haud acuto, apice producto. Caput et pronotum pallide pubescentia, hoc nitido subtilissime nec distincte punctato. Elytra pallide pubescentia, sat nitida, subtiliter, subaequaliter, parum fortiter punctata. Long. 3.5 mm.

In some examples the suture and lateral margins of the elytra are dark. The pubescence of the elytra is not dense, but in fresh examples is evenly distributed over their dorsal surface. The puncturation is rather stronger in some examples than in others. The metasternum is strongly carinate in front.

HAB. Kauai; 3000—4000 ft.

(2) *Mirosternus testaceus*, sp. nov.

Praecedentis forma et colore, elytris parum pubescentibus, circum suturam rugulosis vel ruguloso-punctatis, caeteris partibus parcissime punctatis distinguendus. Long. 3.5 mm.

Distinguished from the preceding by the sculpture of the almost glabrous elytra. This sculpture varies in intensity. The basal club joint sometimes appears subquadrate rather than triangular but this is not constant, the antennae of the same example not always appearing alike in this respect.

HAB. Kauai, 3000—4000 ft.

(3) *Mirosternus punctatissimus*, sp. nov.

Praecedentibus forma et colore simillimus, elytris usque ad margines et partibus apicalibus dense aequaliter punctatis, pubescentia densiore vestitis distinguendus. Long. 3.25 mm.

Antennae varying as in the preceding, the basal joint of the club usually triangular, but sometimes appearing subquadrate. Sculpture not varying much, very dense and even on the apical portion of the elytra, sparsely or little punctured only near the shoulders. Pronotum more distinctly punctured than in the preceding. Colour variable, in one example the head and thorax are black, as well as the sides of the elytra broadly, the rest of their surface being dark brown, instead of the usual ferruginous colour.

HAB. Oahu, Maui.—Oahu, widely distributed, in both ranges; Maui, Haleakala.

(4) *Mirosternus excelsior*, sp. nov.

Praecedentibus forma et colore simillimus, sed oculis minoribus, singulis spatio frontis intermedio latioribus. Elytra juxta suturam utrinque angustissime dense subtiliter punctata, caeteris partibus fere glabris, parce sed grossius punctatis. Long. 3.5 mm.

Head and thorax no doubt densely pubescent in fresh examples, and with a narrow line of pubescence on each side of the elytral suture, where the puncturation is dense. Elsewhere the elytra are smooth and shining with remote largish punctures, which tend to form rows. The antennae are entirely reddish, but the colour of these varies in the preceding species also. The sex of the specimen described is uncertain, since in the allied forms both sexes have the metasternum strongly carinated, and in this insect the carina is both long and strong. If it be a female the male would probably have the space between the eyes less wide. In any case this species is quite distinct.

HAB. Lanai, in January 1894.

(5) *Mirosternus pyrophilus*, sp. nov.

Praecedentibus simillimus, ferrugineus, flavido-pubescent, antennalis clavae articulorum 1 et 2 angulo interno sat acuto facile distinguendus. Long. 3.5 mm.

Apical side of basal club joint a little irregular or sinuate, its inner angle consequently appearing somewhat produced, the following joint with this angle quite sharp. Elytra more or less densely pubescent along the suture and there densely and finely punctured, external to this with larger and more remote punctures and the surface more rugulose, at the sides shining, longitudinally rugulose and with sparse punctures or impunctate, the sculpture of the elytra showing some variation. The space between the eyes varies in width, but whether this is sexual is uncertain. Each of these is as wide or wider than the least frontal space between them.

HAB. Hawaii, Kilauea, two examples.

(6) *Mirosternus basalis*, sp. nov.

Testaceus, capite et pronoto picescentibus, plaga elytrorum basali subtriangulari marginibusque nigricantibus. Pronotum subopacum, densissime subtiliter punctatum, dense pubescens. Elytra juxta marginem basalem suturamque et in parte apicali dense punctata, partibus caeteris remote minus subtiliter punctatis, et parum pubescentibus. Long. 3.7 mm.

General appearance and form of the several preceding species, but distinct by its colour and sculpture. The antennal club is largely developed, but the first and second joints have the inner angle rounded off and quite blunt. Metasternum carinate, apical joint of antennae very long and narrow. Sex uncertain.

HAB. Maui, Haleakala, 4000 ft.

(7) *Mirosternus sordidus*, sp. nov.

Nigricans aut piceoniger, pallide pubescens, oculis permagnis. Pronotum indistincte, subtilissime punctatum. Antennalis clavae articulus basalis triangularis, latere interno quam latus apicale evidenter brevior. Elytra densius distincte punctata, sat aequaliter pallide pubescentia. Long. 3.5 mm.

Quite unlike all the preceding in general appearance, owing to its dark colour, but with similar enormous development of the eyes. The elytra are rather strongly punctured, and the basal club joint of the antennae is remarkable, the side between the base and the inner angle being considerably shorter than the side between this angle and the apex. The latter side also is slightly irregular or sinuate. The metasternum is flat in front and strongly carinate.

HAB. Kauai; apparently rare.

(8) *Mirosternus hawaiiensis*, sp. nov.

Niger, oblongus, subrobustus, griseo-pubescent, femoribus anterioribus saepe rufescentibus, oculis spatio frontis intermedio singulis latioribus, antennarum clava permagna. Elytra lateribus exceptis subaequaliter distincte punctata et griseo-pubescentia. Long. 3.5 mm.

A more robust species than any of the preceding, black, with the tarsi often yellow or reddish, the face and pronotum pitchy red, the antennal club usually black, rarely obscure reddish, the other joints frequently more or less red. Punctuation of elytra very close and distinct, but at the sides the surface becomes shining and the sculpture of a punctate-rugulose character, the punctures sparser and coarser. The inner angles of the largely developed club joints of the antennae are not sharp and these joints are less developed in some specimens, which may be females.

HAB. Hawaii, at lower elevations, 2000—3000 ft.

(9) *Mirosternus frigidus*, sp. nov.

Praecedenti simillimus, et illius forte varietas, oculis evidenter fortius separatis tantum certe distinguendus. Long. 3.75 mm.

Doubtfully distinct from the preceding, which it resembles in nearly all respects, except that the eyes are very obviously and considerably more widely separated.

The whole of the front legs and the femora of the middle pair, as well as the scape and funicle of the antennae are red or testaceous. As compared with a specimen of the preceding the metasternum was more strongly concave, the channel finer and not distinctly crenulate, the carina in side view very short and strongly curved.

HAB. Hawaii; at 5000 ft. The preceding species was found in the wet belt of Mauna Loa, the present one above it.

(10) *Mirosternus epichrysus*, sp. nov.

Fusco-niger, totus dense aureo-pubescent, antennis rufescentibus, scapo clavaque sordidioribus. Oculi singuli spatio frontis intermedio evidenter latiores. Pronotum subtilissime punctulatum. Elytra densissime et subtilissime aequaliter punctata, et pubescentia, lateribus tantum fere glabris, parce punctatis. Long. 3 mm.

Quite distinct by its dense golden vestiture and other characters. The antennal club joints are large with the inner angles very distinct but not sharp. The width of one of the eyes is somewhat greater than the distance, where least, between them. The metasternum is carinate.

HAB. Oahu, near Honolulu.

(11) *Mirosternus duplex*, sp. nov.

Niger, fusco-niger aut piceus, flavido-pubescens. Oculi maris permagni. Antennarum clava magna, articuli 1 et 2 angulis interioribus subacutis. Elytra dense subrugulose fortius, apices versus minutissime, punctata, lateribus rugulose punctatis. Long. 3 mm.

The above diagnosis applies only to the male, which is fairly easily distinguished by the characters given. Except near the shoulders the sculpture on the sides of the elytra is close and rugulose to, or very near to, the lateral margin. The eyes are very large, the club joints of the antennae in certain aspects have an appearance of being slightly produced at their inner angles, making them acute.

The female is entirely different in many ways, the eyes are small and very remote, the antennae are much smaller, but the club joints appear to be similarly formed, though the characteristic appearance, owing to their small size, is less noticeable; the elytra, except on the apical portion, are much more sparsely punctate, while at the sides they are smooth, except for some very fine longitudinal sulci, and very sparse punctures.

HAB. Hawaii, occurs at Kilauea and the sexes have been taken in cop.

(12) *Mirosternus euceras*, sp. nov.

Major, oblongus, castaneus, antennis nonnunquam nigricantibus, sat dense flavido-pubescens. Oculi permagni, spatio frontis intermedio fere bis latiores. Antennarum clava permagna, angulis interioribus haud acutis. Pronotum dense, minutissime punctulatum. Elytra ex majore parte dense distincte punctata, lateribus fere ad apices glabrioribus, parce punctatis. Long. 3.5 mm.

Distinct by its colour, robustness, sculpture, huge eyes, etc. The elytral puncturation is less dense from a little way behind the base, and becomes excessively dense and minute on the apical portion.

HAB. Molokai, 3000 ft.

(13) *Mirosternus lanaiensis*, sp. nov.

Praecedenti cognatissimus, sed colore magis nigricante, elytris apices versus plus minus pallidioribus. Elytra parte apicali excepta distincte, minus dense punctata. Long. 3.5 mm.

The elytra are closely punctate along the basal margin as in *M. euceras*, and also are more sparingly punctured behind this, while on the apical portion both species have similar dense puncturation, except that in the present species these dense punctures extend to the lateral margins for a considerable distance towards the base. The eyes



are perhaps rather less developed and this is a smaller and darker insect. It greatly resembles some examples of *M. muticus*, but the large eyes separate it. The metasternal carina is obsolete.

HAB. Lanai.

(14) *Mirosternus blackburni*, sp. nov.

Niger, pronoto dense punctato, pubescentia grisea plus minus aureo-tincta vestito. Oculi maris magnitudine mediocres, latissime separati. Antennarum maris articuli 3 ultimi magni, horum primo intus sat acute angulato, latere apicali fortiter concavo sive emarginato. Antennae feminales mediocriter magnae. Elytra albida sive cinerea pubescentia appressim vestita, post media maculam pulchram pubescentiae aureae densam utrinque ferentia, his maculis fasciam, ad suturam valde angustatam, formantibus, parte longa apicali basique summa densissime punctatis, plaga intermedia fere glabra, nitidissima, sparsissime punctata, sulcis longitudinalibus obsoletis faciliter distinguendis, sutura elevatula. Metasternum ♂ antice fortiter carinatum. Long. 2.3—3 mm.

Cannot be confused with any other species except the following, which is perhaps hardly more than a local race. The antennae in these species sometimes have the club joints yellow.

HAB. Oahu ; Waianae mountains, 2000 ft. or more ; five specimens.

(15) *Mirosternus blackburnioides*, sp. nov.

*M. blackburni* affinis et persimilis, sed pubescentia elytrorum aurea fasciam latam formante, multo latius suturam attingente, et plagam multo majorem elytrorum postice tegente.

HAB. Oahu ; common in the Honolulu range ; easily distinguished, when in good condition, but often abraded.

(16) *Mirosternus affinis*, sp. nov.

Niger, nitidus, pronoto subtilissime punctato, pubescentia pallida vestitus. Oculi latissime distantes. Maris antennarum clava magna, articulo primo et secundo triangularibus, apicibus sat fortiter productis. Clava antennarum feminalis quam in mare multo minor. Elytra juxta suturam utrinque dense subtilissime punctata, parte caetera fere glabra, subseriatim et minus subtiliter, obsoletius, parce punctata, longitudinaliter obsolete sulcata. Long. 2.5—3.25 mm.

*M. affinis* var. *suturalis* nov.

Praecedenti simillimus, elytrorum parte dense punctata et pubescente posterius latiore distinguendus.

HAB. Kauai, Oahu, Molokai.—Kauai (var. *suturalis*) one example; Molokai; 3000 ft., three specimens.

(17) *Mirosternus sculptus*, sp. nov.

Castaneus, plus minus nigrotinctus, elytris apices versus pallidioribus. Antennae (?sexus) mediocres, clava mediocri, articulo primo multo longiore quam latiore, latere apicali leviter concavo sive emarginato, apice evidenter, sed parum fortiter producto. Oculi mediocres, latissime separati. Pronotum dense flava sive aurea pubescentia obtectum, subtilissime et ad medium remote punctatum. Elytra ex magna parte fere glabra, nitida, parum punctata, longitudinaliter fortiter canaliculata sive rugosa, basi extrema, apicebusque longe, densissime punctatis et conspicue pubescentibus. Long. 2.5 mm.

The sex of the unique example is uncertain. The longitudinal grooves on the glabrous portion of the elytra are nearly regular almost to the suture, where the sculpture becomes more ordinarily rugose.

HAB. Oahu, a single specimen in the mountains behind Waimea, 2000 ft.

(18) *Mirosternus varicolor*, sp. nov.

Nitidus, rufescens, capite pronotoque plus minusve obscuratis aut nigricantibus, elytrorum parte media plus minusve nigricante aut obscurata, antennarum clava nigra. Oculi mediocriter magni, late distantes. Antennarum ♂ clava magna, articuli primi angulo interno haud acuto. Pronotum dense subtiliter punctatum, pallide pubescens. Elytra ad basim extremam necnon in parte apicali dense et subtilissime punctata et pallide pubescentia, parte intermedia fere glabra, sparsissime punctata, punctis his majoribus. Long. 2.5 mm.

This little species varies in colour and may be either rufescent with more or less of the middle part of the elytra dark, or black with the red of the elytra forming a spot on each side at the base and an apical pale area.

Three males were captured in the same spot and a single female, which no doubt belongs to the same species, was taken with them. This has the antennae much wider apart, the head and pronotum paler, the intermediate portion of the elytra less smooth, being a little more punctured and with fine but rather conspicuous rugulosity of the surface.

HAB. Molokai; on the lower edge of the forest above Kaunakakai.

(19) *Mirosternus montanus*, sp. nov.

Niger, piceus aut rufopiceus, sat nitidus. Pronotum trans basim subtilissime dense punctatum et pubescens, antice sparsius pubescens, puncturatione vix discernenda. Oculi mediocres, latissime distantes. Antennarum clava mediocriter magna, articulo primo minus fortiter dilatato. Elytra nitida fere glabra, circum suturam dense, subtilissime, obscure, sive obsoletim punctulata, ibique subtiliter pallide pubescentia, parte caetera subtilissime longitudinaliter rugulosa et sparsissime obsolete punctata. Metasternum haud aut obscurissime carinatum. Long. 2.5—3 mm.

The sexes apparently do not differ greatly in the development of the club joints of the antennae, or else the ten examples are of the same sex and the individuals rather variable. What I consider to be males have the club joints of only moderate size.

HAB. Kauai; various localities.

(20) *Mirosternus rugipennis*, sp. nov.

Niger, nitidus, pronoto plus minus pallide pubescente, elytris glabris. Oculi ♂ mediocres, latissime distantes. Antennarum clava ♂ magna, articulo primo acute intus angulato, latere apicali concavo sive emarginato, angulo apicali sat producto. Clava feminalis maris multo minor, sed angulo interno articuli primi sat acuto. Pronotum posterius dense, subtilissime, antice vix evidenter punctatum. Elytra sparsissime (nonnunquam vix evidenter) punctulata, longitudinaliter subregulariter subtiliter sulcata, suturam juxta haud lineam dense punctulatam praebentia. Metasternum ♂ parum concavum, sed posterius sulcatum, antice carina elongata et distincta praeditum. Metasternum ♀ sat fortiter concavum, carina obsoleta aut absente. Long. 2—3.5 mm.

HAB. Hawaii; Mauna Loa, about 3000 ft.

(21) *Mirosternus simplex*, sp. nov.

Niger aut piceus, nitidus, pronoto minus dense pallide pubescente. Oculi ♀ (? et ♂) minores, latissime separati. Antennarum clava ♀ (? et ♂) haud magna, angulo articuli primi interno et secundi haudquaquam acuto. Pronotum subtilissime puncturatum, nitidum, minus dense pubescens. Elytra nitida, fere glabra, juxta suturam angustissime impressa sive deplanata, ibique subtilissime punctulata et brevissime pallido-pubescentia, basi extrema a scutello ad humeros hoc modo vestita et punctulata, caeteris partibus sparsissime punctatis, vix aut haud rugulosis. Long. 2.4 mm.

HAB. Hawaii, Kona, 3000 ft. I have seen two examples, one of which is a little immature and is a female; the other is probably of the same sex. It is black and has been badly damaged by unskilled mounting.

(22) *Mirosternus denudatus*, sp. nov.

Niger, subnitidus, pronoto subtilissime punctato et pallide pubescente, *M. simplici* simillimus, sed elytris ad suturam haud impressis, ibique haud densissime punctulatis et pubescentibus distinguendus.

I have seen but two examples of this species, probably females, since the club joints of the antennae are not at all large. Both have been badly damaged by unskilled mounting. The punctures near the suture of the elytra are not so small as usual, quite different from the dense and excessively minute ones of other allied species, though towards the apex of the elytra they become denser and finer and there the surface becomes pubescent. The extreme basal margin is also more or less closely punctate and pubescent.

HAB. Molokai, 3000 ft.

(23) *Mirosternus latifrons*, sp. nov.

*M. simplici* simillimus, niger, nitidus, pronoto pallide pubescente, elytris ex maiore parte fere glabris, parce subseriatim punctatis, suturam juxta et ad marginem basalem densissime punctulatis, ibique pubescentibus. Antennarum clava magna, articulo primo late triangulari, apice fortiter producto, angulo interno acuto. Oculi latissime separati. Metasternum antice fortiter carinatum. Long. 2.2 mm.

I have seen only one example of this minute species. It may prove to be the male of *M. simplex*.

HAB. Oahu.

(24) *Mirosternus pusillus*, sp. nov.

Niger, nitidus, pallide pubescens. Oculi haud magni, latissime separati. Antennarum clava (♂) magna, articulo primo late triangulari, angulo interno fortiter acuto, secundo sat lato, margine apicali et margine interno fere aequilongis. Pronotum minus dense pubescens. Elytra ex magna parte perparce (nec subtilissime) punctata, parum pubescentia, parte apicali minutissime punctulata et minus dense pallido-pubescente, basi summa subtiliter vix sparsim punctata, sutura apicem versus sat fortiter impressa. Metasternum antice planum, fortiter carinatum. Long. 2.2 mm.

I have seen only one example of this species.

HAB. Oahu, in company with *M. latifrons*.

(25) *Mirosternus irregularis*, sp. nov.

Niger, sat nitidus, pube pallida subflavescente vestitus. Oculi haud magni, latissime separati. Antennarum clava sat magna, articulo primo ad apicem producto, angulo interno haud acuto. Pronotum minutissime punctatum, antice punctis vix

discernendis, nitidum. Elytra haud dense subirregulariter punctata, punctis magnitudine inaequalibus, leviter sive subobsoletim impressis, minus dense sed subaequaliter pallida pubescentia ubique vestita. Metasternum antice deplanatum et fortiter carinatum. Long. 2.3 mm.

I have seen only one example of this very obscure species, which is not at all closely related, I think, to any of the preceding. It is not in very good condition and I was unable to examine it very minutely. It may belong to one of the species near *M. carinatus* Sharp.

HAB. Maui, Haleakala (5000 ft.).

(26) *Mirosternus laevis*, sp. nov.

Oblongus, nitidus, pronoto picescente, elytris (♀?) testaceis aut (♂?) nigrosuffusis, parte apicali tantum maculaque utrinque humerali testaceis. Oculi minores, latissime distantes. Antennarum clava fusca, articulo primo minore. Pronotum pallide pubescens. Elytra nitida, glabra, suturam juxta obsolete punctata, parte caetera laevi, sparsissime, vix evidenter, punctata, sutura apicem versus evidenter impressa. Long. 2.2 mm. (alter minor, sed fractus).

I have seen but two examples of this species and both have been more or less damaged by unskilled handling in the attempt to expand the antennae. In the paler example, which is, no doubt, a female, the metasternum is concave and there is a feeble, elongate, raised line or carina in front. In the other example possibly a male the metasternum has been damaged and I cannot determine its structure.

HAB. Kauai, 4000 ft.

(27) *Mirosternus fractus*, sp. nov.

Niger, antennarum clava minor, elytris ex majore parte rufescentibus, fere glabris, parcissime punctatis. Long. 3 mm.

I have only seen one specimen in a fragmentary condition, but the species appearing rather remarkable, I have ventured to describe it. The antennal club is not at all strongly developed, the first and second joints with the inner angle not acute, and the apex not much produced. The elytra are mostly red, having a basal transverse black band, which is continued down the suture for two-thirds of their length. Along the suture the puncturation is excessively minute, and posteriorly it is impressed and bears a little pale pubescence. Elsewhere there are very sparse punctures, feebly impressed and of larger size. The basal black colour is also continued for some distance along the lateral margins beneath the shoulders.

HAB. Lanai, 2000 ft.

(28) *Mirosternus molokaiensis*, sp. nov.

Niger (nonnunquam plus minus piceus) nitidus, elytris postice saepe, ad humeros nonnunquam, rubromaculatis, pronoto pallide pubescente. Oculi minores, late separati. Antennarum clava angustior, articulo primo haud aut haud multo, quam secundus, latiore, elongato, margine externo internoque ex magna parte fere parallelis. Elytra glabra, nitida, subtilissime rugulosa, parum (saepe vix evidenter) punctata. Long. vix 2—2.5 mm.

A most distinct species in spite of the variability in colour. I suspect that the examples with the narrowest and most strongly parallel-sided basal joint of the club of the antennae are males, those in which it is more normal, that is more triangular in shape are females. I have seen only eight or nine examples, most of which have been roughly handled in mounting. The bright red markings are very characteristic, when present.

HAB. Molokai, on the lowest skirts of the forest.

(29) *Mirosternus kauaiensis*, sp. nov.

Niger, nitidus, pronoto plus minusve pubescente, elytris fere glabris, antennarum clava tenuissima et elongata, articulo primo angustissimo, elongato, lateribus fere parallelis, secundo circa bis longiore quam latiore, tertio angustissimo et valde elongato. Elytra suturam juxta dense subtiliter punctulata, parte caetera sparsim, minus subtiliter punctata, punctis ex majore parte seriatim dispositis. Oculi latissime separati. Long. 2.2 mm.

Allied to *M. molokaiensis* but with the antennal characters still more exaggerated, and the elytra differently sculptured. One example, probably a ♂, taken.

HAB. Kauai; 4000 ft.

(30) *Mirosternus ignotus*, sp. nov.

Niger, parum nitidus, pronoto griseo-pubescente, subtiliter punctulato. Oculi minores, latissime distantes. Antennarum clavae articulus primus parum fortiter dilatatus, hujus et secundi angulo interno haudquaquam acuto. Elytra juxta suturam, necnon in parte basali circa scutellum subfortiter ruguloso-sculpturata, ibique griseo-pubescentia, parte caetera subtiliter rugulosa, punctis obsoletis perpaucis, vix videndis. Long. 2.5 mm.

The single example taken had been very roughly manipulated, being partly broken and very dirty and covered with gum. It has not been possible to study it very satisfactorily, as it could only be handled very carefully in cleaning off the dirt. It appears to most nearly resemble some examples (probably ♀) of *M. molokaiensis*, but the basal

joint of the antennal club is less narrow and less parallel-sided than in the probable males of that species. Its duller and (in parts) more strongly sculptured elytra will also readily distinguish it. No doubt the pubescence is more or less abraded in the type.

HAB. Hawaiian Islands, perhaps Hawaii. The specimen was without any number.

(31) *Mirosternus lugubris*, sp. nov.

Niger, nitidus, pronoto pallide pubescente, oculis mediocribus, late distantibus. Antennarum clava ♂ magna, articulo primo et secundo late dilatatis, apicibus fortiter productis; antennarum clava ♀ multo minor. Pronotum ubique pubescens, subtilissime punctatum. Elytra nitida, apices versus densissime minute punctata et pubescentia, basi extrema sat dense punctata et pubescente, parte intermedia ♂ parce aut haud dense, ♀ parce aut parcissime punctata, fere glabra aut minus pubescente. Metasternum ♂ antice fortiter carinatum. Long. 2.5—3.2 mm.

This is a variable species and difficult to characterize. Normally the elytra behind the extreme base are extremely sparsely punctured in the ♀, but a good deal less sparsely in the ♂. In the former sex the surface is often glabrous with slight longitudinal sulci and a few punctures only. In extreme ♂♂ the same part is not very remotely punctate and is pubescent, but both punctures and pubescence are less dense than on the apical portion of the elytra. Some males however closely resemble the female in sculpture, and some of the latter more nearly approach males. Exactly the same difficulty occurs with other species of the genus. On account of its variability, difficulty may be encountered in separating *M. lugubris* from forms on other of the islands, but it cannot be confused with species of similar sculpture on Hawaii, because it has smaller eyes than these.

HAB. Hawaii; found in the wet belt of the forests at an elevation of 2000—3000 ft.

(32) *Mirosternus maurus*, sp. nov.

Niger, aut piceus, nonnunquam (immaturus?) testaceus, oblongus, elytris elongatis, lateribus fere parallelis. Antennarum ♂ clava maxima, articulo primo ad apicem valde producto, triangulari aut quasi quadrangulari, magnitudine et forma variabili, articulo ultimo, quam solitus, latiore, apice truncato. Oculi minus magni, et latissime distantes. Clava antennalis ♀ maris multo minor. Pronotum nitidum, subtilissime punctulatum, griseo-pubescent. Elytra nitida, ex majore parte fere glabra, linea pubescentiae griseae suturali sat distincta, ibique minus subtiliter ruguloso punctata, sutura apicem versus sat fortiter impressa. Long. 3 mm.

The puncturation of the elytra varies, as well as other features mentioned above, the punctures being sometimes close and rugulose only narrowly along the suture, at

other times spread much further over the dorsum. Club of antennae not at all large in the female and sometimes pallid. In one example the sides and apex of the elytra are reddish brown.

HAB. Kauai, 4000 ft.

(33) *Mirosternus parvulus*, sp. nov.

Niger, nitidus (pronoto et capite saepe plus minus piceis) pronoto pallide pubescente et subtilissime punctato. Oculi ♂ sat magni sed late distantes, spatio intermedio frontis, quam unus ex his, multo latiore. Oculi ♀ sat magni, oculis ♂ vix minores. Antennarum ♀ clava haud magna, angulo interno articuli primi haud acuto; clava maris sat magna, articuli primi apice sat fortiter producto. Elytra pernitida, fere glabra, postice circum suturam pubescentia pallida anguste (saepe lineatim) vestita, ibique subtilissime dense punctata, partibus caeteris usque ad marginem basalem perparce (nec subtilissime) punctatis et longitudinaliter rugulosis. Long. 2—2.5 mm.

Varies a little in the puncturation, the very fine punctures sometimes extending to the base of the elytra along the margins of the scutellum in an unbroken narrow line on each side of the suture, while sometimes these lines are interrupted on the basal portion of the elytra, but become distinct again on either side of the scutellum. This densely punctured area also sometimes spreads out more widely on the more apical portion of the elytra.

I have seen a small series only of this little species, but I think it is not at all rare in the Honolulu range.

HAB. Oahu; Honolulu range, 1500—2800 ft.

(34) *Mirosternus eutheorus*, sp. nov.

Nigricans aut piceo-niger, elytris nitide rufo-brunneis aut testaceis, oblongus. Oculi permagni, sed sat late distantes, spatio frontis intermedio, quam unus ex his, haud minus lato. Antennarum ♂ clava magna, articulo primo late triangulari, angulo interno minus acuto, secundo etiam late triangulari, angulo interno rotundato. Pronotum sat nitidum, pubescentia pallida conspicue vestitum. Elytra ex majore parte fere glabra, nitida, sparsim remote punctata, suturam juxta et ad marginem basalem dense subtilissime punctulata, ibique pallide pubescentia. Metasternum totum concavum, antice fortiter carinatum. Long. 2.75 mm.

A small species with unusually large eyes, which are widely separated. The metasternum is concave for its whole length, not flat (or almost so) in front, where it bears the carina, as is the case in most of the strongly carinated species. I have seen only a few specimens.

HAB. Oahu, Waianae mountains.



(35) *Mirosternus nigrocastaneus*, sp. nov.

Nigrocastaneus, minus nitidus, antennarum basi rufescente, clava nigricante. Oculi magni, singulis ac spatium frontis intermedium fere aequae latis. Pronotum pallide pubescens, nitidum, parum distincte punctatum. Elytra ad suturam dense punctata, ibique pallide pubescentia, parte caetera subtiliter rugulosa, sparsim subobsolete minus subtiliter punctata, sparsim et parum conspicue pubescentia, sutura versus apicem haud impressa. Metasternum ♂ anterieus fortiter carinatum. Long. vix 3 mm.

I have seen but one example, no doubt a male; the antennae are strongly developed, but of usual form, the two basal club-joints triangular, somewhat strongly dilated, with the inner angle blunt.

HAB. Kauai, Halemanu.

(36) *Mirosternus xanthostictus*, sp. nov.

Nigricans aut plus minusve piceus, antennarum articulis basalibus pedibusque rufescentibus, capite pronotoque pallide pubescentibus, hoc subtilissime minus distincte punctulato. Oculi sat magni sed late distantes. Antennarum articuli 3 ultimi sat magni, horum primo haud acute intus angulato, apice fortius producto. Elytra flavescencia, plaga magna subtriangulari basali, fascia transversa postmediana, sutura, marginibusque lateralibus, nigricantibus, fere glabra, parcissime obsolete punctata. Long. 2.5 mm.

The two examples described are probably males and the species is unlike any other. A third example taken subsequently and I think in another locality is a marked and perhaps constant variety, the posterior yellow colour of the elytra is reduced to two small spots, the punctures are more evidently serially arranged in shallow grooves and are more distinct, while the antennae are also slightly different.

HAB. Oahu, Waianae mountains; the variety probably in the Honolulu range.

(37) *Mirosternus bicolor* Sharp.

*Mirosternus bicolor* Sharp, Tr. Ent. Soc. London, 1881, p. 525.

I have seen one example of this insect, taken either by Koebele or myself, when collecting together. Previously I had supposed that the specimens of *M. xanthostictus* would prove to be *M. bicolor*, since they came from the same locality as the type of the latter species. The two are, however, quite distinct. The eyes of *M. bicolor* are of moderate size and are widely separated.

HAB. Oahu, Waianae mountains (Blackburn); Honolulu mountains.

(38) *Mirosternus glabripennis* Sharp.

*Mirosternus glabripennis* Sharp, Tr. Ent. Soc. London, 1881, p. 524.

This species greatly resembles *M. montanus* and allied species in sculpture but is easily distinguished by the much larger eyes, the width of one of these being not much less than the space, where least, between them. There is a slight tendency in the elytra to become uneven from longitudinal grooves or depressions and of the very sparse subobsolete punctures to be serially arranged. Whether the types, which are supposed to be ♂ and ♀, are really so, and not slightly differently developed examples of one sex is I think doubtful.

Since the above was written I have myself taken an example of *M. glabripennis*, which before was wanting in my collection, in the Honolulu range of mountains, and still more recently another yet nearer to Honolulu itself. I have never found it in the Waianae mountains nor is it likely to exist there now at so low an elevation (1000 ft.) as that at which it was found by Blackburn. The antennae are sometimes rufescent.

HAB. Oahu, Waianae mountains (1000 ft.) Blackburn; near Waialua and near Honolulu, 1200—1500 ft.

(39) *Mirosternus pallidicornis*, sp. nov.

Nigrocastaneus, nitidus, capite, pronoto elytrorumque apicibus plus minus rufescentibus, antennarum clava lucide testacea. Oculi majores sed late separati. Antennarum clava (♀ et ♂?) mediocriter magna, articulo primo triangulari, angulo interno haud acuto. Pronotum parum nitidum, pubescens, subtilissime punctatum. Elytra elongata, nitida, ex majore parte fere glabra, tantum juxta suturam (praecipue apicem versus) dense et minutissime punctulata, ibique aureo-pubescentia, parte glabra sparsissime minus subtiliter punctata. Long. 3.75 mm.

Very closely allied to *M. glabripennis* Sh., but distinguished by the more elongate elytra, which become very gradually narrower from base to apex. Having seen but one example, I do not know whether the colour of the antennae is constant. The same pallid colour is known to appear as a variation in several other species and probably occurs in most.

HAB. Kauai, 4000 ft.

(40) *Mirosternus peles*, sp. nov.

Nitidus, niger, pronoto pallide pubescente. Elytra elongata, fere glabra, nitidissima, sparsissime punctata, circum suturam (saltem posterius) minutissime punctata, pallideque pubescentia, parte apicali latera versus obsolete ruguloso-sculpturata. Oculi

maris majores sed late separati. Metasternum anterius obsolete sive vix evidenter carinatum. Long. 3—3.5 mm.

Very like *M. glabripennis*, but a more elongate insect, and easily distinguished by the fact that the pubescence, instead of forming a narrow line along each side of the suture, spreads out posteriorly as a thin covering over the general surface, the surface having a feeble, but close, rugulose sculpture to, or nearly to, the lateral margins on the apical portion. The club of the antennae is only very moderately developed. I have examined a satisfactory series.

HAB. Hawaii; widely distributed at 4000 ft. and above in dry localities.

(41) *Mirosternus angulatus*, sp. nov.

Brunneus, nitidus, capite nonnunquam obscuriore. Oculi haud magni, latissime separati. Antennarum clava sat magna, articulo primo triangulari, fortiter dilatato, angulo interno conspicue acuto. Pronotum flavido-pubescent, nitidum, ex majore parte obsoletissime, sive vix evidenter, punctatum. Elytra ad suturam, anterius angustissime, posterius late, subtilissime dense punctulata, ibique pubescentia, caeteris partibus fere glabris, nitidissimis, parcissime punctatis, punctis majoribus, levissime impressis, latera versus subtilissime longitudinaliter rugulosa. Metasternum carinatum. Long. 3 mm.

This appears to be a very distinct species. The fine puncturation of the elytra is confined to the sutural margin anteriorly, but posteriorly spreads widely outwards, though not nearly attaining the lateral margins. The inner angle of the antennal club joints is unusually sharp.

HAB. Maui, Haleakala, 4000—5000 ft.

(42) *Mirosternus konanus*, sp. nov.

Niger, nitidus, capite et pronoto obscure rufescentibus, hoc elytrorumque apicibus sat dense aureo-pubescentibus. Oculi ♂ magni, ex his unus spatio frontis intermedio vix minus latus, oculi ♀ multo minores et late distantes. Antennarum clava ♂ magna, articulo primo lato, angulo interno haud acuto. Antennarum clavae ♀ articulus primus articulo maris secundo vix major. Elytra nitida, sat elongata, parte apicali usque ad margines laterales densissime punctata, et pubescente, parte reliqua fere glabra sparsissime punctata, parum aut haud rugulosa, basi extrema haudquaquam dense punctata. Long. 2.75—3 mm.

I have seen only three examples.

HAB. Hawaii; Mauna Loa within the wet belt.

(43) *Mirosternus cognatus*, sp. nov.

Nigricans, nitidus, capite pronotoque et parte apicali elytrorum plerumque plus minusve rufescente. *M. konano* similis et affinis, sed antennarum ♂ clavae articulis minus dilatatis, oculisque minoribus distinguendus. Metasternum anterius haud carinatum. Long. 3.5 mm.

I have examined about a dozen examples of *M. cognatus* and find only small differences between the joints of the antennal club in any of these, although it is hardly possible that both sexes are not represented. The antennae, in fact, are very like those of the female of *M. konanus*. If, therefore, I understand the species rightly, and both sexes of *M. cognatus* are present, the males having a slightly more developed antennal club, then this species is entirely distinct from *M. konanus* by the only slight, sexual dimorphism, and the much smaller eyes and antennal club of the ♂.

HAB. Maui, Haleakala, 5000 ft.

(44) *Mirosternus amatus*, sp. nov.

Rufobrunneus, pronoto sat dense flavo-pubescente. Oculi magni, prominentes, sed sat distantes, unus ex his spatio frontis intermedio vix latitudine aequalis. Antennarum clava sat magna, angulis internis sat rotundatis, haud acutis, articuli secundi apice parum producto. Elytra parce pubescentia, nitida, minus subtiliter punctata, apicibus opacis, densissime minute punctatis, densius flavo-pubescentibus, parte basali extrema (nisi juxta humeros) haud dense punctata. Long. 2.75 mm.

Closely allied to *M. konanus* &c. The punctures on the more glabrous parts of the elytra are less fine than usual, and seem uneven in size. Even along the suture the puncturation is not very dense and fine except posteriorly. Along the basal margin the punctures are by no means dense except perhaps close to the humeral prominence.

I have seen but one specimen, which having been bred is in very fine condition; and probably more clothed with hairs on the smooth parts of the elytra than a caught specimen would be. Its antennae are pale in colour, but this is not likely to be a constant character. The tree from which it was bred was entirely dead, but I think it was a *Cheirodendron*.

HAB. Oahu, Honolulu range, 1500 ft.

(45) *Mirosternus parvus*, sp. nov.

Castaneus aut castaneo-niger, sat nitidus, pronoto sat dense pubescentia pallida, saepe flavescente, vestito, subtilissime (anterius perparce) punctato. Oculi ♂ majores sed sat distantes, feminae, quam maris, multo minores et latissime distantes. Antennarum clava ♂ magna, articuli primi apice fortiter producto, angulo interno haud acuto;

clava ♀ multo minor, articulo primo angusto, circa bis longiore quam latiore. Elytra minus fortiter elongata, ex maiore parte fere glabra, parcissime vel etiam vix evidenter punctata, conspicue subtiliter longitudinaliter rugulosa, parte apicali dense minute punctata et pallide saepe flavide pubescente. Long. 2.75—3 mm.

I have seen only 5 examples of this species and there is some variation in the development of the individuals, but I cannot doubt that they are one species. The colour of the antennae &c. varies as in many other species. One example was taken close to Honolulu in the mountains at 1500 ft. in 1896, two more in 1900, and two in the same range but twenty miles away in 1901. It would therefore seem to be rather scarce.

HAB. Oahu, near Honolulu and elsewhere, 1500 ft.

(46) *Mirosternus subparcus*, sp. nov.

Capite et pronoto brunneis aut rufescentibus, elytris brunneo-nigris, marginibus et circa suturam apicem versus pallidioribus, *M. parco* cognatissimus, sed oculis conspicue majoribus distinguendus.

I separate a single specimen from *M. parcus* on account of the conspicuously larger eyes, the width of one of these, in a front view of the face, being about equal to the space between the eyes. I see no other specific character.

This specimen was collected by Koebele on Oahu, on one of the occasions when he accompanied me, but it bears no definite locality label.

HAB. Oahu; collected by A. Koebele in 1900 or 1901.

(47) *Mirosternus hypocoelus*, sp. nov.

Major, rufescens, flavo-pubescent, elytris nigrocastaneis, apicaliter rufescentibus. Oculi magni, sed late distantes. Antennarum clava major, articuli primi et secundi angulo interno haud acuto, apicibus minus fortiter productis. Elytra ex magna parte fere glabra, perparce punctata, nitida, parte apicali densissime subtilissime punctata, ibique conspicue flavo-pubescente, parte suturali utrinque angustissime crebre punctata, basi extrema evidenter flavo-pubescente et subtilissime crebre punctata, sutura in parte elytrorum declivi fortiter impressa. Metasternum postice profunde concavum, antice distincte carinatum. Long. 3.75 mm.

Only one example of this species was taken. It was in company with *M. euceras*, which in some respects it greatly resembles. It is allied apparently to *M. cognatus*, but easily distinguished from that and *M. konanus* by the close puncturation at the base of the elytra. I feel quite uncertain of the sex of the unique specimen.

HAB. Molokai, on the lowest edge of the forest above Kaunakakai.

(48) *Mirosternus muticus* Sharp.

*Mirosternus muticus* Sharp, Tr. Ent. Soc. London, 1881, p. 523.

This species is very abundant on Hawaii and no doubt is common on Maui, though I did not take many specimens there. It varies in size, colour and puncturation. The eyes are large, but rather widely separated even in the ♂.

HAB. Maui, Hawaii.—Maui, Haleakala; Hawaii, widely distributed (4000—5000 ft.).

(49) *Mirosternus discolor*, sp. nov.

Colore variabilis, fusco-niger, castaneus, aut nigro-castaneus, capite cum pronoto saepe elytris pallidior, subnitidus, parcius pallide pubescens. Oculi magni, singulis ac frontis spatium intermedium fere aequale. Antennarum clava sat magna, plerumque brunnea aut rufescens, articulo primo triangulari, fortiter dilatato, angulo interno haud acuto, apice fortiter producto. Pronotum subtilissime indistincte punctulatum, pallide pubescens. Elytra subnitida, haud dense pubescentia, puncturatione indistincta et plus minus obsoleta, male definita. Long. 3—3.5 mm.

This is an obscure species but not difficult to recognize, having the eyes of large size and the elytral puncturation feeble. In fresh examples the pubescence is most noticeable along the sutural portion of the elytra, where the puncturation is usually close and very fine. Beyond this there is a good deal of very fine surface rugulosity and the punctures are remote and feeble. The puncturation varies considerably. I am not able to be sure as to the sexes in this species.

HAB. Hawaii, Kilauea.

(50) *Mirosternus marginatus*, sp. nov.

Ferrugineus sive rufo-brunneus, pronoto sordidior, sat dense pubescentia pallida flavescens vestitus. Oculi magni, sed late separati, singulis spatio frontis intermedio evidenter minus latis. Antennarum clava magna, articulis 2 basalibus quodam in aspectu quasi quadrangularibus. Pronotum subtilissime minus distincte punctatum, bene pubescentia vestitum. Elytra subaequaliter subtiliter punctata, et pubescentia, marginibus obscurioribus aut plus minus nigricantibus, sutura apicem versus fortiter impressa. Metasternum anterius planum et fortiter carinatum. Long. 3.25 mm.

Superficially like *M. oculatus* &c., but with much smaller eyes, which are much more widely separated.

HAB. Kauai, 4000 ft.

(51) *Mirosternus eximius*, sp. nov.

Niger, antennis rufis, clava nigra, elytris densissime punctatis, postice subtilissime cinereo-tomentosis, anterieus pubescentia aurea, ad latera postice prolongata, vestites. Oculi mediocres, latissime separati. Antennarum clava maxima, articulis 2 basalibus latis, angulo interno quasi levissime producto, conspicue acuto. Elytra anterieus dense punctata, posterius omnium densissime et minutissime punctulata, lateribus humeros juxta nitidis. Metasternum antice brevissime carinatum sive tuberculatum. Long. 2.75 mm.

Quite unlike any other species, the rather coarse yellow pubescence of the basal half of the elytra is prolonged backwards towards the sides, the grey apical tomentum being excessively fine and short; the antennae are also remarkable, the basal joint of the club having a slight irregularity or sinuation of the margin of its sides, which increases the acuteness of its inner angle. This structure is also more or less perceptible in the second club joint.

HAB. Oahu, without locality, collected by Koebele and myself; two specimens.

(52) *Mirosternus punctatus* Sharp.

*Mirosternus punctatus* Sh., Tr. Ent. Soc. London, 1881, p. 526.

Unless I have taken it recently, I do not know this species. I believe I possess a specimen from Kauai that agrees fairly well with the description, but it is not at present available for examination.

HAB. Oahu, Waianae mountains (Blackburn).

(53) *Mirosternus solitarius*, sp. nov.

Niger, dense subtiliter subaequaliter punctatus, totus pubescentia pallida flavescenti vestitus. Oculi sat magni, sed late separati. Antennarum clava magna, articulo primo triangulari, fortiter dilatato, angulo interno haud acuto. Pronotum subtiliter (ad basim dense) punctatum. Elytra crebre distincte punctata, lateribus versus humeros nitidis et perparce punctatis. Metasternum ♂ fortiter carinatum. Long. 3.5 mm.

I have seen only one ♂ of this species. It appears to be distinct from *M. punctatus* Sharp by the more widely dilated basal two joints of the antennal club and the apical joint is also less narrow and, owing to the oblique truncation, sharper at the apex.

HAB. Oahu, Honolulu range, 1500 ft.

(54) *Mirosternus amaurodes*, sp. nov.

Niger, antennis fere nigris, tibiis nigris, femoribus anterioribus rufis. Oculi magnitudine mediocres, latissime separati. Antennarum clava ♂ magna, articulo primo fortiter dilatato, angulo interno haudquaquam acuto, apice fortiter producto. Elytra dense subtiliter punctata. Long. 3.25 mm.

I have seen two males only of this species, both entirely denuded of pubescence, and one much mutilated by unskilled mounting. It is very similar to *M. solitarius* of Oahu, but the eyes of that species are so much larger, it is impossible to treat them as belonging to one species.

HAB. Hawaii, Kona, 3000 ft., in the wet belt.

(55) *Mirosternus plebeius*, sp. nov.

Nigricans, fusco-niger aut piceus, capite (et nonnunquam pronoto) elytris saepe pallidiore, pallida (cinerea aut flavescente) pubescentia vestitus. Oculi magnitudine mediocres, aut minores, latissime separati. Antennarum clava ♂ sat magna, articulis 1 et 2 fortiter dilatatis, angulis internis haud acutis. Pronotum nitidum, ex majore parte vix evidenter punctatum. Elytra crebre plus minus obsolete punctata, puncturatione plus minus rugulosa, lateribus nitidis rugulosis, parce punctatis, punctis versus humeros perpauca. Metasternum carinatum. Long. 2.75—3.25 mm.

This species is best recognized by the elytral puncturation, which is dense and of an indefinite character, the punctures tending to run into one another, and making the surface rugulose. The antennae of the female are small, much less developed than in the ♂, the eyes are remote and not at all large in either sex. There is some variation in the intensity of the puncturation. In both sexes the metasternum is carinate, the carina in the ♂ longer than that of the female.

HAB. Hawaii, Kilauea.

(56) *Mirosternus elongatulus*, sp. nov.

Brunneus aut fusco-niger, pubescentia flavescente crebre vestitus, forma sat elongata. Oculi mediocres, late separati. Antennarum clava magna, articulo primo triangulari, fortiter dilatato, apice (necnon etiam secundi) fortiter producto, angulo interno acuto aut saltem parum obtuso. Elytra densius aequaliter pubescentia, crebre punctata, lateribus humeros juxta nitidis, parce punctatis. Long. 3—3.5 mm.

Except that one example is black or nearly so, the three examples agree very well in most respects. Though everywhere dense on the dorsal surface, the puncturation of the elytra becomes still more dense and minute on the apical part. It is also dense along the lateral margins except towards the shoulders. The legs and two basal joints



of the antennae are red in all the specimens, the club joints black, the intermediate joints red in two and dark in the other example. I should think all three are certainly males and I do not know the other sex. The elytra are unusually elongate.

HAB. Maui, Haleakala, about 4000 ft.

(57) *Mirosternus tetragonus*, sp. nov.

Niger, fusco-pubescent, elytris dense punctatis, antennarum articulo secundo rufo, tibiis nigricantibus. Caput subtiliter punctatum, oculis mediocribus, latissime separatis. Antennarum clava magna, articulo basali subquadrangulari, apice fortiter producto, articulo secundo triangulari, apice fortiter producto. Elytra ex majore parte aequaliter crebre punctata, fusco-pubescentia, lateribus fere ad humeros dense punctatis, sutura postice impressa. Metasternum antierius fortiter carinatum. Long. 2.75 mm.

The single example is no doubt a male and is easily distinguished by the antennae and sculpture. The puncturation of the pronotum appears to be very indistinct, much more so than that of the head.

HAB. Kauai, 4000 ft.

(58) *Mirosternus rufescens*, sp. nov.

Rufescens, capite obscuriore, pronoto antice, elytrorum lateribus, sutura, antennarumque clava nigricantibus, pallide pubescens. Oculi magnitudine mediocres, latissime separati. Antennarum clava magna, articulo primo quodam in aspectu quasi subquadrangulari, apice fortiter producto. Pronotum subtiliter vix dense sat evidenter punctatum. Elytra pubescentia pallida flavescente vestita, apices versus usque ad margines laterales densissime et subtilissime punctata sive sculpturata, ad basim et juxta suturam subtiliter sat crebre punctata, caetera parte minus dense punctata. Long. 2.5 mm.

The single example is no doubt a male, the antennal club being well developed. The first joint of this club in certain aspects has an almost subquadrangular appearance, part of the inner margin appearing to be nearly parallel to the outer. This character with the colour, sculpture of thorax and elytra &c. distinguish the species.

HAB. Maui, Haleakala, about 5000 ft.

(59) *Mirosternus dubiosus*, sp. nov.

Nigricans, pronoto picescente, pubescentia flavescente vestitus. Oculi minores, latissime separati. Antennarum clava sat magna, articulo primo quasi quadrangulari, vix latissime dilatato, apice fortius producto. Pronotum densius pubescens, vix nitidum, crebre ubique (sed indistincte) minutissime punctulatum. Elytra supra dense punctata et pubescentia, latera versus nitida, fere glabra, longitudinaliter rugulosa, parce (nec

subtiliter) plus minus seriatim punctata. Metasternum late depressum, carina forti et elongata antice instructum. Long. 2.75 mm.

The single example described is no doubt a male. Both the first and second club joints of the antennae have a more or less evident quadrangular shape. The sculpture of the elytra is dense and they are well clothed with pubescence over the middle third or more of their width, exterior to which the punctures become remote and the surface nearly bare.

A female example taken at the same time and place probably belongs to this male; the antennae are a good deal smaller and the first and second joints of the antennal club are triangular (as it is quite likely they would be in some specimens of the male) and the whole club is more or less pale in colour. The latter is also a character of no importance in Hawaiian Anobiidae.

I have a male specimen procured in another locality and at a later time which considerably resembles the male described. The antennal club is rather larger, the puncturation of the elytra is coarser in part, and the area of dense punctures does not extend so far outwards from the suture. It is impossible to decide whether this is another species or a variety of *M. dubiosus*.

HAB. Oahu, Koolau range.

(60) *Mirosternus carinatus* Sharp.

*Mirosternus carinatus* Sharp, Tr. Ent. Soc. London, 1881, p. 524.

The male of the species, which I refer to *M. carinatus* Sharp, from the description, is a black insect, but the female is brown in colour. I have examined many specimens and have no doubt as to the sexual dimorphism, since I have taken examples in cop. There is a very considerable variation in the puncturation, at least in the females, some having this much more sparse than others. The eyes in both sexes are not at all large and very widely separated. The metasternum of the female is without a carina in front, or at least has only a rudimentary one, much more feeble than that of the ♂. I refer to the same species numerous specimens from Kauai, which are of much smaller average size, sometimes even minute, but the largest examples of these equal or exceed the smaller ones from Maui. Both on Kauai and Maui the puncturation of the elytra shows the same variability and is very perplexing. I should think it very probable that Blackburn's *M. acutus* is a variety of the Kauai form of this species.

HAB. Kauai, Maui.—Maui, Haleakala (4000—5000 ft.); Kauai (3000—4000 ft.), a common species.

(61) *Mirosternus acutus* Blackburn.

*Mirosternus acutus* Blackburn, Tr. Dublin Soc. 1885, p. 160.

I have suggested under *M. carinatus*, that *M. acutus* may be a form of that species. Ten years ago I made a superficial examination of *M. acutus*, but for purposes of identification it would be necessary to relax and thoroughly clean the unique type, before coming to any decision on this point.

HAB. Kauai (Blackburn).

(62) *Mirosternus tristis*, sp. nov.

Niger, griseo-pubescent, antennis (articulo secundo saepissime excepto) nigris aut fere nigris, tibiis nigris aut nigricantibus, femoribus anterioribus plerumque, et nonnunquam caeteris, rufescentibus. Oculi minores et latissime separati. Antennarum clava magnitudine mediocris, articulo secundo triangulari, angulo interno plus minusve acuto. Pronotum ex majore parte obsolete punctatum, nitidum. Elytra dense subtiliter, plerumque plus minus rugulose, punctata, griseo-pubescentia, lateribus longitudinaliter rugulosis, et plus minus nitidis. Long. 2.5—3.25 mm.

If I am correct in assigning a short series of examples to this one species, this is one of the most difficult and obscure forms in the genus. I cannot determine the sexes, for while some examples have larger antennae than others, some are intermediate in this respect. There is a good deal of variation in the puncturation also. The black colour, generally dense elytral puncturation, grey pubescence, moderate antennal club, with the inner angle of the basal joint sharper than usual, and the very widely separated eyes are the chief characters. The metasternum appears to be usually if not always carinate, but the carina is not strong and varies in development.

HAB. Hawaii, Kona district, above the wet belt.

(63) *Mirosternus vestitus*, sp. nov.

Rufescens aut castaneus, elytrorum apicibus subpallidioribus, totus sat dense flavo-pubescent. Oculi sat magni, sat late distantes. Antennarum articuli 3 ultimi mediocres, horum articulo primo sat elongato (minus lato) angulo interno haud acuto, apice haud fortiter producto. Elytra dense subtiliter punctata, parte apicali vel subtilius et densissime punctulata, lateribus nitidis et ruguloso-punctatis. Long. 3.25 mm.

There is not much difference between the four examples I have examined; at most the basal club joint of the antennae is rather wider in proportion to its length in some than in others, and this might indicate a sexual distinction. It is, however, quite likely that all are of the same sex. The colour, clothing and puncturation seem to distinguish the species.

HAB. Oahu, Honolulu range, 1500 ft.

(64) *Mirosternus debilis* Sharp.

*Mirosternus debilis* Sharp, Tr. Ent. Soc. London, 1881, p. 525.

To this species I refer four examples taken on Oahu, and I believe it to be very variable in colour. Some of these specimens are black with a red spot on each wing case towards the apex, or there may be in addition to these a basal red spot on each, or the whole insect may be reddish, a darker area traversing the elytra behind the base. The puncturation varies in intensity. The eyes are small and very remote.

HAB. Oahu, Waianae mountains.

(65) *Mirosternus varius*, sp. nov.

Niger, elytris ad basim singulis saepe rufo-notatis, versus apices etiam saepe rufo-maculatis, sat nitidus. Oculi minores, latissime separati. Antennarum clava haudquaquam magna, articuli 1 et 2 angulo interno haud acuto. Pronotum nitidum, pallide pubescens, sed vix distincte punctatum. Elytra subaequaliter pallida pubescentia vestita, subtiliter sat aequaliter sed plus minus indistincte aut obsolete punctata. Long. 3.25 mm.

Except when more or less brightly marked with four red spots on the elytra (some or all of these spots may be absent), this is an obscure species. It is chiefly distinguished by the small eyes, moderate or small antennae (sometimes even the club being pallid) and the close but indefinite or subrugulose puncturation of the elytra, which is very shallow. The clothing of these is evenly distributed.

HAB. Kauai, 4000 ft.

(66) *Mirosternus hirsutulus*, sp. nov.

Brunneus, elytris nigro-marginatis, pubescentia pallida flavescente dense vestitis. Oculi minores, late separati. Antennarum clava angustula, elongata, articulo primo elongato, minus fortiter dilatato, angulo interno haud acuto. Pronotum subtiliter punctatum, sat dense pubescens. Elytra subtiliter, sat crebre subaequaliter punctata, lateribus nitidis, fere glabris, rugulosis et parce punctatis, punctis majoribus, leviter impressis. Long. 2.5—3 mm.

I have examined two specimens, which agree in nearly all respects, except that one is much larger than the other. The pubescence is rather coarse and shaggy. This character, together with the colour and the elongate narrow basal joint of the club of the antennae, the puncturation, and glabrous sides of the elytra will distinguish the species.

I have also a specimen, given me by Koebele, from Oahu, but without special locality, which differs in the colour of the elytra, the side margins not being black, and

also another in which the basal joint of the club of the antennae is less elongate, wider in proportion to its length. I suspect these belong to the above species and the one with the wider club joint may be the other sex.

This species somewhat resembles *M. vestitus*, but that has smoother pubescence and larger eyes.

HAB. Oahu, Waianae mountains; Honolulu mountains (?), Koebele.

(67) *Mirosternus stenarthrus*, sp. nov.

Niger, dense ubique punctatus, dense cinereo-pubescens. Oculi minores, latissime separati. Antennarum clava angustior, articulo primo elongato, minus fortiter dilatato, angulo interno haud acuto. Pronotum distincte, subfortiter, ubique dense punctatum. Elytra dense, subaequaliter, distincte punctata, lateribus humeros juxta nitidis, ruguloso-punctatis. Long. 3—3.5 mm.

There are two examples of this species, which I have marked as ♂ and ♀, but it is not stated that they were taken in cop. If they truly represent the sexes, then these must be extremely similar in this species. The comparatively strong and distinct puncturation of the pronotum is characteristic of the species and will greatly facilitate its determination as also the basal antennal joint, which is longer than usual in proportion to its width.

HAB. Oahu, Honolulu mountains.

(68) *Mirosternus dimidiatus*, sp. nov.

Nigricans, dense pubescentia pallida flavescenti vestitus, elytris crebre punctatis. Oculi minores, latissime separati. Antennarum clava mediocriter magna, articulo primo fortius elongato, minus fortiter dilatato, angulo interno haud acuto. Pronotum subtilissime indistincte punctatum, dense pubescens. Elytra dense subtilissime punctata, lateribus versus humeros nitidis, parce punctatis, punctis majoribus, subobsoletis. Long. 2.5—2.75 mm.

In most respects very like *M. stenarthrus*, but much less in bulk, and at once distinguished by the feebleness of the pronotal puncturation. The pubescence of the elytra is rather rough, being directed in different directions. Only two specimens have been examined which agree very closely in all respects, and the sex cannot be determined without dissection.

HAB. Oahu, Honolulu mountains.

(69) *Mirosternus obscurus* Sharp.

*Mirosternus obscurus* Sharp, Tr. Ent. Soc. London, 1881, p. 523.

I refer to this species a series of specimens obtained on four of the islands. It varies in colour from brown to pitchy or almost black. The club joints of the antennae are usually pale, or at least not black, and compared with most species of the genus the club joints are unusually ill-developed. The eyes are small and very widely separated. The dense puncturation is continued right to the lateral margins of the elytra, and extends along these the whole way to the base. Very fresh examples from Oahu have the pubescence of the elytra more irregularly disposed than those from Hawaii, but otherwise seem to be identical.

HAB. Oahu, Molokai, Maui, Hawaii.—Widely distributed on Hawaii.

(70) *Mirosternus solidus*, sp. nov.

Major, fusco-niger, antennis testaceis. Oculi mediocriter magni, latissime distantes. Antennarum clava parum magna, articulo primo elongato, parum fortiter dilatato, angulo interno haud acuto. Pronotum crebre et distincte ubique punctatum, dense pallido-pubescent. Elytra distincte crebre punctata, apices versus densissime minutissime punctulata, ubique flavido-pubescentia, lateribus usque ad humeros dense punctatis. Metasternum haud carinatum; abdominis segmentum ultimum ventrale ad apicem sat distincte impressum. Long. 3.75 mm.

I have seen only one example of uncertain sex. The pubescence is of a rather obscure yellowish colour. The species is allied to *M. obscurus* Sharp.

HAB. Kauai, 4000 ft.

Fam. BOSTRYCHIDAE<sup>1</sup>.

All the Bostrychidae found in the islands have, no doubt, been introduced by man. Some of them are now extremely common and *Schistoceros cornutus*, *Apate lifuana* and *Sinoxylon conigerum* may be considered as injurious insects, and perhaps some of the others should be placed with these.

## SCHISTOCEROS Lesne.

*Schistoceros* Lesne, Ann. Soc. ent. France LXVII. 1898 (1899), p. 502.

(1) *Schistoceros cornutus* Pall.

*Schistoceros cornutus* Pall., sec Lesne, Ann. Soc. ent. France, 1898, p. 510.

*Bostrichus migrator* Sharp, Tr. Dublin Soc. 1885, p. 160.

HAB. Hawaiian Islands, abundant. I have taken the same species in Mexico. Hawaiian specimens vary greatly in size. Widely distributed in America and the Antilles.

<sup>1</sup> By R. C. L. Perkins and D. Sharp.

XYLOTHRIPS Lesne.

*Xylothrips* Lesne, Ann. Soc. ent. France LXIX. p. 624.

(1) *Xylothrips religiosa* Boisd.

*Xylopertha religiosa* Boisd., Lesne, l. c.

*Apate lifuana* Mont., Ann. Soc. ent. France, 1861, p. 267.

HAB. Hawaiian Islands, very abundant.

XYLOPSOCUS Lesne.

*Xylopsocus* Lesne, Ann. Soc. ent. France LXIX. p. 627.

(1) *Xylopsocus castanoptera* Fairm.

*Apate castanoptera* Fairm., Essai sur les Col. de la Polyn. p. 77.

HAB. Oahu, Kauai and no doubt all the islands.

SINOXYLON Duftsch.

*Sinoxylon* Duftsch., Lesne, Ann. Soc. ent. France LXXV. p. 462.

(1) *Sinoxylon conigerum* Gerst.

*Sinoxylon conigerum* Gerst., Lesne, l. c. p. 504.

HAB. Oahu and no doubt all the islands.

DINODERUS Stephens.

*Dinoderus* Steph., Lesne, Ann. Soc. ent. France LXVI. p. 321.

(1) *Dinoderus minutus* Fab.

*Dinoderus minutus* Fabr., Lesne, Ann. Soc. ent. France LXVI. p. 329.

HAB. Oahu.—I have seen a specimen, determined by Schwarz. It was taken from bamboo furniture.

RHYZOPERTHA Stephens.

(1) *Rhyzopertha dominica* Fabr.

*Rhyzopertha pusilla* Steph., Ill. Brit. Ent. III. p. 354 ; *dominica* Fabr., Lesne, Ann. Soc. ent. France LXXVII. p. 332.

HAB. Oahu, Hawaii and no doubt the other islands.

Fam. LYCTIDAE<sup>1</sup>.

## LYCTUS Fabricius.

*Lyctus* Fabr., Ent. Syst. I. 2, 1792, p. 502.

(1) *Lyctus brunneus* Stephens.

*Xylotrogus brunneus* Stephens, Ill. Brit. III. p. 117.

*Lyctus brunneus* Sharp, op. cit. p. 245.

We have received 26 specimens, varying in size from  $4\frac{3}{4}$ — $5\frac{1}{2}$  mm. long. This species has been transported to various parts of the world.

HAB. Oahu, Hawaii, Kauai.—Oahu: widely distributed (Blackburn); Waianae mts. 2000—3000 ft. (Perkins).—Hawaii: Kaumana, Hilo, 2000 ft. (Perkins).—Kauai: 4000 ft. (Perkins). Europe; introduced into Madeira, &c.

(2) *Lyctus*, sp.?

We have received two specimens of a species not previously found in the Sandwich Islands. Comparison with the specimens in the British Museum shows it to be apparently very close to *L. griseus* Gorham (Biol. Centr.-Am. III. 2, p. 212).

It is ferruginous, with a conspicuous yellow-grey pubescence. The elytra have series of large shallow punctures. The antennae are rufo-testaceous, lighter in colour and much more slender than those of *L. griseus*. The prothorax is slightly narrowed posteriorly, and has a shallow depression on the posterior part of the disc; such a depression is absent in *L. griseus*. The larger specimen is about  $2\frac{3}{4}$  mm. long.

HAB. Oahu: Honolulu, XI. 1900 (Perkins). Probably introduced.

<sup>1</sup> By Hugh Scott.



## Supplement

to

*Cerambycidae, Curculionidae and Proterhinidae.*

Families previously treated in Vol. II., pp. 91-246.

Fam. CERAMBYCIDAE<sup>1</sup>.

*Aegosoma reflexum*, huj. op. II., p. 96.

This fine Prionid has now been found on the N.W. Koolau range in July 1901, so that the island of Oahu is to be added to its recorded habitat in Hawaiia.

*Astrimus hirtus* Fairm.

*A. hirtus*, huj. op. II., p. 96.

This species has again occurred at Honolulu after an interval of 20 or 30 years, Dr Perkins having found a single specimen in the year 1900. This individual is a fine female, quite fresh, and it is probable that the species is really naturalized in Oahu.

*Clytarlus fragilis* Sharp.

*C. fragilis* Sharp, huj. op. II., p. 99. •

Dr Perkins has obtained a female of this rare species from another locality. It is of very dark colour but agrees well with the specimens from the Palolo valley and the Waianae mountains.

HAB. Oahu, N.W. Koolau range, July 1901.

(1) *Clytarlus ultimus*, sp. nov.

Depressus, opacus, fuscus, cinereo-squamosus, antennarum, tibiarum femorumque basibus testaceis; elytris dense punctatis, fasciis irregularibus squamosis, utrinque prope scutellum elevatis, basi summo pallidiore; femorum clava brevi, abrupta. Long. 5—7 mm.

This is extremely similar to *C. fragilis*, but can be distinguished by the shorter and slightly more abrupt club of the femora. In this respect it is the most extreme form of the genus.

HAB. Oahu, S.E. Koolau range, Sept. 1900. Six specimens (Perkins). D. S.

<sup>1</sup> By R. C. L. Perkins and D. Sharp.

(1) *Plagithmysus giffardi* Perkins<sup>1</sup>.

*P. giffardi* Perkins, Proc. Hawaiian Ent. Soc. 1., p. 96.

Very closely allied to *P. sulphurens*, but the hair is whitish instead of yellow.

HAB. Hawaii, Kilauea (Perkins).

(2) *Plagithmysus fractus*, sp. nov.

Black, the base of the femora, the lower part of the sides of the pronotum, and the sternum red, the elytra with a fulvescent spot on each at the base, these spots separated by the dark suture, and not reaching the sides of the elytra outwardly. The antennae show a very faint reddish tint in part and the dull red colour of the femora shades into the black of the thicker portion. Elytra somewhat evenly covered with grey pubescence, so that the usual furcate mark is less distinct than usual. Thorax excessively densely sculptured and dull with a number of transverse ridges, some represented by raised tubercles only, the flanks smooth and shining hardly punctured below. Elytra very densely punctured all over, except on the humeral prominences, the furcate pubescent mark delimited by obscure longitudinal ridges outwardly and a black, less pubescent area at the base.

This species resembles only *P. cuneatus* of Oahu and is probably of the same average size.

HAB. Molokai; many fragments found in a decayed tree below the forest proper, but only one specimen worth taking, was amongst these. R. C. L. P.

(3) *Plagithmysus immundus*, sp. nov.

♂ Ferrugineus, femorum basibus testaceis; thorace vix pube pallida ornato, elytris maculis valde irregularibus pubescentiae pallidae vix ornatis. Long. 8—14 mm.

♀ Variabilis. Piceus, femorum tibiarumque basibus testaceis, tarsi fusco-testaceis; prothorace obsolete bivittato, elytris pube pallida irregulariter ornatis, basi interdum testaceo. Long. 8—14 mm.

This is an aberrant *Plagithmysus* somewhat approximating to *Clytarlus*. It is very variable, especially in the female sex, but there is always a great difference between the sexes as regards the general colour. It is also a connecting link between *Clytarlus* and *Plagithmysus*; the posterior legs of the male are shaped like those of *Plagithmysus*, though the apical portion is shorter and the basal part longer than in normal *Plagithmysus*. In the female the more slender legs approximate greatly those of the same sex of *Clytarlus pennatus*.

<sup>1</sup> The species enumerated in this supplement by numbers prefixed are additions to the fauna.

The saddle along the middle of the thorax is rather wide, it is more elevated in front in the male than it is in the female, and it bears in each sex 2 or 3 feeble transverse ridges; the slight longitudinal depression that runs along each side of it bears a scanty pallid setosity, so feeble that it may be overlooked except in well-cleaned specimens; owing to the darker ground-colour of the female, these faint stripes are more distinct in it. The elytra are densely and finely punctured and have no trace of a glabrous area; the variegation of the elytra is irregular and so variable that it cannot be easily described. The legs are very slender in the female, and the clavate portion in it is always infusate so as to contrast strongly with the pallid basal part; the tibiae, though yellow are always darker at the tip, in the female more extensively than in the male. The hind tarsi are slender and long. In each of the sexes there is a very definite spot of white pubescence at the posterior extremity of the metasternal episterna.

Dr Perkins reared a series of about 100 specimens of this species from wood found on North Kona, but of what tree I do not know.

HAB. Hawaii, North Kona; the specimens emerged in Nov. and Dec. 1900. D. S.

*Plagithmysus solitarius* Sharp.

*P. solitarius*, huj. op. II., p. 106.

♀ Nigricans, antennis, tibiis tarsisque rufis, femorum basibus testaceis; elytris nigro-rufis, maculis albidis ornatis; thorace parum discrete albido-vittato; tibiis posterioribus dense nigro-hirsutis, tarsis albido-hirtis. Long. 11—16 mm.

This species has hitherto been known from a single male individual. The female has now been discovered and proves to be very different in colour from the male. Twenty-one specimens recently found are about eight of them females, the remainder males. Two pairs were found in copula, so that there is no doubt as to the correct association of the two forms as the sexes of one species. Some of the very small specimens have the male coloration, but are certainly females.

In the females found in copula the concolorous ferruginous ground-colour of the male is replaced by black, while the elytra are midway between black and ferruginous.

The species varies very much in size, the length being from 8—14 millimetres.

The female of *P. solitarius* is very like the male of *P. aequalis*, but it has the hind tibiae densely hirsute, and the marks do not coalesce to form on the posterior part of the elytra a white stripe.

The difference in colour of the sexes found in copula is very remarkable, and so is the variation in colour of the female. It is, however, quite possible that a larger series might show that the male is also variable in colour in a similar manner.

HAB. Oahu, Koolau range both to the north-west and south-east, and at various dates from April to September 1901 (Perkins). D. S.

(4) *Plagithmysus elegans*, sp. nov.

Rufus, prothorace ochraceo-vestito, post oculum vitta denudata, dorso longitudinaliter nigerrimo; elytris dense vermiculatim albido-setosis, post medium utrinque area glabra; tarsi posterioribus albido-hirtis; femoribus posterioribus basi flavescente; corpore subtus ochraceo-maculato. Long. corp. 14 mm.

This is the most elegant of the Hawaiian *Plagithmysus*; it is not at all closely allied to any other, and may be placed as the first species of the genus. The broad black space on the middle of the thorax is of a narrow oval form, and contrasts in a most striking manner with the broad yellow area that joins it on each side; there are no ridges across it; in front it forms an abrupt perpendicular elevation, and falls away more gently behind. The elytra are red, vaguely but broadly infuscate behind the base, and on this part densely and coarsely punctured: bearing white spots of setosity which, in some places, are elongate or confluent so as to form sinuous markings; towards the apex each elytron has an elongate, glabrous, shining area. The legs are moderately long, the hind femora a little darker red than the others, but the slender basal portion is pale yellow: there is not the least tendency to a knob at the apex, but they bear a good deal of delicate, erect, white setosity. The hind tibiae are only moderately long, are strongly laterally compressed, and densely clothed with hair that is nearly black in colour; the hind tarsi are equally densely clothed with pure white hair, and contrast therefore with the tibiae in a very striking manner. The middle tarsi bear white hairs along the inner margin only. The sides of the body beneath have conspicuous ochreous marks, and the breast has a good deal of white pubescence, which is dense on the mesosternal process. Described from a single individual of the male sex.

In the style of coloration and the shape of the thorax this charming insect makes a distinct approach to the genus *Callithmysus*, but the legs remain quite different.

HAB. Hawaii; North Kona in 1900 (Perkins). D. S.

(5) *Plagithmysus simplicicollis*, sp. nov.

Rufus, elytris ad basin et ad suturam ochreo-tomentosis, margine laterali etsi anguste-tomentoso, post basin fusco-biplagiatis, femoribus posterioribus et intermediis basibus testaceis, tarsi posterioribus albido-hirtis. Long. 14—15 mm.

This fine *Plagithmysus* may be placed near *P. bishopi*, from which, as well as from most of the other allies, it may be at once distinguished by the unicolorous prothorax, entirely destitute of white stripes. The two large spots of dark colour near the base of the elytra are very conspicuous and very sharply limited, each is narrowly separated from the suture by the ochreous pubescence and extends all across the disc of the elytra, becoming narrower externally. The legs are red, which allows the species to be readily separated

from *P. collaris*. The male only is known; it has the front tarsi a good deal dilated, the middle tarsi clothed with white hairs along the inner edge. The hind tibiae are very hirsute with erect tawny hairs. The abdomen has a band of white hairs on each side. The mesothoracic and metathoracic epimera are densely clothed with ochreous scales. Three specimens.

The type specimen of the species is rendered additionally interesting as being an exponent of a form of monstrosity that has, I believe, not before been observed. To the second joint of the left anterior foot there is attached—in addition to the ordinary terminal joints—a supernumerary termination of the tarsus, consisting of two joints placed dorsum to dorsum, and so closely amalgamated that they look like a single segment clothed on its two exposed aspects with hairs normal to an under surface of the foot. This supernumerary appendage is terminated by a short, thick, claw-joint ending in a single small claw. The true foot is a little shorter than is natural.

This superadditional fourth joint is not lobed, and it may be the case that it is not two joints, but only one bilobed joint folded.

HAB. Hawaii. North Kona, 1900 (Perkins). D. S.

*Callithmysus microgaster* Sharp.

*Callithmysus microgaster*, huj. op. II., p. 113.

Two additional specimens have now been found of this very rare insect. They are small, being only 10 mm. long, and the clothing of the hind tibiae is much shorter than in the typical form.

Only six individuals are known of *C. microgaster*. They come, I believe, from three different spots on Oahu, and seem to indicate the probable existence of local races.

HAB. Oahu, N.W. Koolau range, April 1901, two specimens (Perkins).

(1) *Callithmysus koebelei* Perkins.

*Callithmysus koebelei* Perkins, Proc. Hawaiian Ent. Soc. I., p. 210.

Ferrugineus, prothorace dorso plaga magna, rufo-ferruginea, pubescentia albida delimitata; elytris dense punctatis, singulo posterius ad suturam linea angusta pubescentiae albae, lineis his mox ante medium valde divergentibus; tibiis posterioribus dense hirsutis, ad basin pubescentia albida; tarsis posterioribus albido-hirsutis; femoribus subtus plus minusve infuscatis, ad basin testaceis. Long. 8—16 mm.

This species resembles in coloration certain forms of *Plagithmysus*—e.g. *P. bishopi* and *P. bilineatus*—and it also lacks the dense black pubescence at the apex of the hind femora that is so conspicuous in *Callithmysus microgaster*. But in the shape of these femora it agrees with *C. microgaster*. It varies much in size, but not in other respects. It is very difficult to distinguish the sexes.

Mr Koebele, in honour of whom the species has been named, secured a small series at various dates.

HAB. Oahu, mountains near Honolulu. D. S.

*Callithmysus cristatus* Sharp.

*Plagithmysus cristatus* Sharp, huj. op. II., p. 113, pl. VI. fig. 21.

A series of 21 additional examples of this interesting but little known species. I remarked, in 1896, on the similarity in shape of the femora of this species with those of the genus *Callithmysus*, and now that *C. koebelei* has been discovered, it is clear that *cristatus* must be transferred to *Callithmysus* notwithstanding the slender femora of its female.

In the 21 specimens recently acquired there are six females; the slender femora is a constant character of this sex of *C. cristatus*, and the female is also generally much darker in colour than the male; this distinction is, however, variable, one individual being but little darker than the other sex. The male varies little, except in size.

Although the dense black hairs at the apex of the hind femora found in *C. microgaster* are absent in *C. koebelei* and *C. cristatus*, yet there is a peculiarity in this spot in both the species in question. In *C. koebelei* the pubescence there is dark brown instead of whitish, as on the rest of the femur; and in *C. cristatus* ♂ the pubescence in the same place is finer, darker and closer.

COPTOPS Serville.

*Coptops* Serville, Ann. Soc. ent. France 1835, p. 64.

(1) *Coptops aedificator* Fabr.

*Lamia aedificator* Fabr., Ent. Syst. I. pt. 2, p. 275.

Three specimens of this species were found on Oahu by Mr Perkins in 1900 and 1901. It is widely distributed in the East and, as it is of large size, has probably been recently introduced. It is only like *Prosoplus bankii*, but is more than twice the size.

HAB. Oahu (Perkins). Java, Aden, etc. etc.

Fam. CURCULIONIDAE<sup>1</sup>.

(1) *Rhyncogonus sharpi*, sp. nov.

Black or pitchy black, shining, legs often more or less reddish, tarsi always rufescent, antennae black or reddish, whole insect with appressed squamous hairs, in fresh specimens flavescent about the eyes and at the sides of the pronotum.

<sup>1</sup> By R. C. L. Perkins.

Head rugose-punctate beneath the clothing, eyes convex, prominent, first funicle joint of antennae notably longer than the second. Pronotum smooth and shining between the punctures and with a median smooth line not extending the whole length. Elytra shining but rough between the series of punctures, in very fresh specimens the surface nearly concealed beneath the squamosity, pseudopipleura regularly clothed all over.

Male with the apical ventral segment broad at the apex and, like the three preceding, densely clothed with hairs; the two preceding and the metasternum with denser patches at the sides, less dense between these and very closely punctured. Length 9—14 mm.

HAB. Molokai, mountains.

(2) *Rhyncogonus simplex*, sp. nov.

Black or piceous, the antennae and legs generally more or less obscurely rufescent in parts, the tarsi always so, clothing not dense, of pale and fine appressed hairs, denser along the sides of the pronotum, forming an entire band or broken into a denser anterior and posterior spot. Pseudopipleura clothed like the dorsal surface of the elytra. Head punctate strigose, first and second funicle joints of antennae nearly equal. Pronotum shining between the punctures, which differ in size. Elytra with about 13 rows of regular punctures dorsally, between these very minutely tuberculate.

Male beneath with the apical ventral segment truncate or widely rounded at apex and with the preceding densely pubescent, in the female these segments are also more pubescent than the others, the apical one narrowly rounded at apex; third segment excessively densely punctured, much more finely than the second. Length ♂ ♀ 7—11 mm.

There appear to be two forms of this species, the one more densely pubescent on the elytra and with the hairs more approaching a squamose condition. This is much the rarer and the two are found in company, while there appears to be no other point of distinction. The species is (like most others of the genus) variable, and while the males are usually more depressed than the females, this is not always the case.

HAB. Molokai, mountains, below the forest, 700—1000 ft.

(3) *Rhyncogonus extraneus*, sp. nov.

Female sordid black or fuscous inclining to red, the antennae and legs sometimes more or less of this colour. Clothing pale, in part subsquamous, very dense all over in fresh examples, in less fresh ones denser on the legs and sides of the pronotum, with a tendency to form maculae, especially on the pseudopipleura. Head roughly sculptured, antennae with the first funicle joint hardly as long as the second, which is much longer than the third. Eyes strongly prominent and convex. Pronotum with distinct punctures not very dense, but with finer interstitial ones connecting them, lateral lines of

clothing distinctly squamose. Elytra with series of punctures, which are finer than is usual in the genus, the clothing of depressed pubescence with a tendency to become maculate, and with numerous short erect setae. Basal abdominal segment beneath densely punctate, some of the punctures deeper and larger than the others.

Length 8 mm. In very fresh and densely clothed specimens the sculpture is almost entirely hidden.

HAB. Oahu; lower slopes of the mountains, below the forest.

(4) *Rhyncogonus oleae*, sp. nov.

Black or piceous, probably sometimes red, clothed with fine pale hairs.

Head between the eyes rugose-punctate, the rostral portion in front of this usually more sparsely punctate. Eyes moderately convex. Two basal joints of the funicle of the antennae slender and strongly elongated, the first a little longer than the second, but in one ♂ they are of equal length, third and following much shorter than the second, but all of them elongate, basal joint of club distinctly longer than the last funicle joint.

Pronotum generally closely and sometimes rugosely punctured, generally more densely in the ♂ than the female, sometimes quite dull, sometimes smooth and shining between the punctures, which are usually uneven in size; a median smooth line is distinct, except sometimes posteriorly; sides of thorax with denser and more conspicuous pubescence in the female, usually less clothed in the ♂. Elytra finely pubescent, with about 12 rows of punctures on the dorsal surface, the pseudopipleura also pubescent, but not maculately so. Two apical segments of the abdomen beneath in the ♂, with somewhat dense pubescence, at least much denser than on the preceding segments; in the female the segments are more thinly clothed, the clothing of the penultimate segment not much different from that of the preceding, the metasternum at the sides much more conspicuously pubescent than in the middle.

Most similar to *R. freycinetiae*, which is a much blacker insect and otherwise different in detail.

HAB. Oahu, Waialua 1200 ft.; on *Olea*, *Euphorbia*, etc.

(5) *Rhyncogonus fuscus*, sp. nov.

Fusco-niger, setis appressis rufescentibus vestitus, opacus, antennis tibiis (plus minusve) tarsisque rufescentibus. Caput minus dense punctatum, oculis fortiter prominentibus. Pronotum inaequaliter punctatum, peropacum, latum, lateribus fortiter rotundatis. Elytra vix maculatim ubique rufo-setosa, pseudopipleuris dorso minus dense vestitis, opaca, interstitio tertio subelevato. Antennarum funiculi segmentum primum et secundum aequilonga, sequentibus, quae aequilonga sunt, multo longiora. Long. 7.5 mm.

HAB. Oahu; Waianae mountains.



*Rhyncogonus koebelei* Perkins.

*R. koebelei* Perkins, huj. op. II., p. 126, pl. VII., fig. 5.

What I believe to be the above species is common on Oahu from Manoa valley to the south-eastern extremity of the Koolau range. It occurs as high as 2000 ft. in the mountains, but is found at much lower elevations—under 1000 ft. Like others of the genus, it is quite variable. The apical ventral segment of the female is pointed and much less densely hairy than that of the male. Varies very greatly in size.

*Pantomorus fulleri* Horn.

*Pantomorus olindae* Perkins, huj. op. II., p. 130 (1900).

*Aramigus fulleri* Horn, Proc. Amer. Phil. Soc. xv. 1876, p. 94.

This species was originally introduced into the island of Maui; subsequently it spread to Oahu, and still more recently to Hawaii. It does great damage to cultivated plants and forest trees in the mountains, but does not become abundant on the lowlands, at any rate in the drier districts. It is polyphagous. It is the *Pantomorus olindae* of my earlier paper on the weevils. Seeing that it was evidently introduced into Hawaii from the warmer parts of America, I did not look for its description amongst the N. American fauna, it being no doubt an introduction also into California and other parts from the same region. It seems to me not separable generically from true *Pantomorus*.

(1) *Acalles pusillissimus*, sp. nov.

Nigricans, antennis, rostro, tarsisque rufo-testaceis. Antennarum articulus secundus subovatus et elongatus, sequentibus brevissimis et transversis. Pronotum elongatum anterius posticeque angustatum, setis brevissimis nigris inconspicue vestitum. Elytra parum lata, lateribus aequaliter rotundatis, interstitiis (primo excepto) aequaliter convexis, haud irregulariter elevatis, plaga pallida squamosa post humeros versus suturam oblique utrinque currente. Long. 1.75 mm.

This is the smallest species of Hawaiian *Acalles*, and is distinguished by its small size, narrow form and the patch of pale squamosity, which tends to form a fascia on the elytra and the extremely short joints of the funicle of the antennae. Unfortunately the type is not in good condition. A specimen, which I am not able to find in the collection, was much more perfect, when taken, and not abraded like the one described. I have met with it still more recently in the mountains near Honolulu.

HAB. Oahu; mount Tantalus; occasionally met with, but not common.

(1) *Nesotocus giffardi*, sp. nov.

Very closely allied to the other species of the genus, but more shining. Pronotum with some scanty pubescence laterally, otherwise almost bare, very smooth and shining and with fine and rather remote puncturation. Anterior femora more swollen than in well-developed *N. munroi*. Elytra with the pubescence more scanty than in the other species. Scape of antennae rather strongly dilated at the apex; funicle joints longer and slenderer than in *N. munroi*.

A very fine species, of which the male only is known.

HAB. Oahu; Tantalus in December.

*Oodemias parallelum* Perkins.

*Oodemias parallelum* P., huj. op. II., p. 162.

A series of specimens of both sexes, which I refer to the above species, exhibit considerable variation in the shape and sculpture of the pronotum, the punctures being much stronger in some than others, and the surface in some is dull. Females are usually larger than the males, and the second tarsal joint is much smaller. The puncturation of the elytra is variable, the interstitial punctures being very strongly developed in some examples, in fact almost sufficiently so as to be confused with those of the striae. Some individuals are much narrower than others.

*Oodemias halticoides* Bl.

*Oodemias halticoides* Blackb., huj. op. II., p. 169.

This species is not rare in the mountains round Honolulu, and is not only found in the dead wood of various forest trees, but also in the stems of low-growing plants.

*Oodemias robustum* Bl.

*Oodemias robustum* Blackb., huj. op. II., p. 169.

I have referred a single example to this species, without, however, having examined the type. I did not meet with it during my earlier visits to the islands.

(1) *Oodemias solidum*, sp. nov.

Brassy-black, the elytra more or less shining, ovate. A large species, very similar to *O. grande* of Kauai, from which it is easily distinguished by its conspicuously metallic colour, and the rows of punctures on the elytra are placed in distinct grooves owing to the more or less convex interstices.

Rostrum not densely nor coarsely punctate, apically at least strigose-punctate. Pronotum broad, generally dull and very finely but distinctly punctured. Elytra with the interstices conspicuously punctured, the punctures much more fine than the rather coarse and deep serial ones. The antennae vary a little, the second joint usually appearing stouter and shorter than the third, but when the basal constricted part of the former is fully exposed, it is sometimes as long as the latter. Length 4.5—6 mm.

Closely allied also to *O. corticis*, but at once distinguished by the coarseness of the serial punctures of the elytra.

HAB. Maui; Haleakala; a common species, I believe, previously confounded with the very abundant *O. corticis* of Maui, Molokai and Lanai.

(2) *Oodemus hawaiiense*, sp. nov.

Brassy, robust, the tibiae and tarsi testaceous, rostrum dilated apically, second and third joints of the antennae subequal when the second is fully exposed.

Allied to *O. punctulatissimum* of Oahu by the second joint of the funiculus being much less elongate than is usual in the group of the genus, but very distinct by the larger serial punctures of the elytra, which are coarse as compared with the very feeble interstitial ones. The punctures in the series are remote, and the inner series fail at about the middle of the length of the elytra or before this. There is no striation, except posteriorly, where the interstices become convex. The eyes are hardly at all convex. Length about 3.5 mm. I have not seen the male of this species.

HAB. Hawaii, Mauna Loa at 4000 ft. Probably common, but overlooked.

*Orothreptes callithrix* Perkins.

*O. callithrix* Perkins, *huj. op.* II., p. 147.

Originally described from Kona, Hawaii, this species has now occurred on mount Tantalus near Honolulu. Though I did not take many specimens, I found it quite common in the month of November. It will probably be found on the other windward islands.

HAB. Hawaii. Oahu; mount Tantalus, not rare.

*Pentarthrum blackburni* Sharp.

*Pentarthrum blackburni* Sharp, *huj. op.* II., p. 147.

On several occasions I have seen imported boxes, with the wood largely destroyed by a *Pentarthrum*, which appears to be the above species. It is no doubt an imported insect.

*Pseudolus hospes* Perkins.

*P. hospes* Perkins, huj. op. II., p. 149.

This has now become one of the commonest of Hawaiian beetles and has extended far into the forests, apparently largely supplanting *P. longulus*. It was originally found in boards of foreign timber in Honolulu, and I have since found it in the wood of crates freshly landed from Fiji. In the latter country *P. longulus* and *Phloeophagosoma tenuis* also occur with it, and have also been imported into Honolulu.

Fam. PROTERHINIDAE<sup>1</sup>.(1) *Proterhinus podagricus*, sp. nov.

Niger aut sordide rufescens, elytris rufescentibus, femoribus nigricantibus, antennis rufis, apices versus nigris vel obscurioribus. Caput cum pronoto parum dense aureo-squamosum, hoc ad angulos posticos plaga parva pallide-squamosa densiore ornato. Elytra fere aequaliter griseo-squamosa, postice setis erectis albidis sparse vestita. Antennae fortius elongatae, articulo primo elongato et incrassato, clava distinctissime 3-articulata, articulis elongatis. Femora maris fortissime incrassata. Long. 2.5—3.25 mm.

A very distinct species by the enormously thick femora of the male, the more than usually elongate antennae, with long robust scape and long and distinctly three-jointed club. Eyes rather small, thorax rather long and more or less distinctly tri-impressed. Elytra simply convex, rather parallel-sided, and with the humeral angles strongly produced. In form it greatly resembles *P. kamptarthrus*, but the male is easily distinguished by the simple third antennal joint, the female by the rather less slender antennae, the shorter and less thin third joint, which is quite simple, while in *P. kamptarthrus* it shows a trace of the form observable in the male. In the latter species too, the pronotum appears to be rather narrower and more elongate.

HAB. Oahu; Waianae range.

*Proterhinus leiorhynchus* Perk.

*P. leiorhynchus* Perk., huj. op. II., p. 200.

I have now obtained a male of this species, which is very closely allied to *P. ruficornis*. Like the female, it may be easily distinguished from that species by the much larger antennal scape, but the character of the thoracic impressions is variable in both species.

<sup>1</sup> By R. C. L. Perkins.

*Proterhinus ruficornis* Perk.

*P. ruficornis* Perk., l. c.

Varies in size, length of pronotum and elytra, and in colour, but the antennae appear to be always unicolorous. In *P. adelus*, which has the same habits as *P. ruficornis*, the antennae vary in colour, sometimes they resemble those of the latter, but sometimes the apical joints are dark. The species are easily separated by the differences in the pronotum and the greater development of the antennae in *P. ruficornis*.

HAB. Oahu; mountains round Honolulu, 1500 ft. and upwards, in company with *P. adelus*.

*Proterhinus deinops* Perk.

*P. deinops* Perk., huj. op. II., p. 201.

The variation in this remarkable species is of the same nature as that exhibited by many others of the genus. The rostrum of the female varies slightly in length and form, the pronotum and elytra are much narrower and more elongate in some than in others, and large examples are fully twice the bulk of small ones. Nevertheless it remains always easy of recognition by the peculiarities of the head and eyes.

*Proterhinus squamicollis* Perk.

*P. squamicollis* Perk., l. c.

A small series of examples were taken in the mountains near Honolulu and other parts of the Koolau range. They agree well with the original specimens and the species is quite distinct from any other.

HAB. Oahu; widely distributed in the Koolau range, but apparently not abundant. I have taken it on *Bobea elatior*, but do not know whether it is confined to this tree.

*Proterhinus adelus* Perk.

*P. adelus* Perk., huj. op. II., p. 202.

I have examined a fine series of this species. In its commonest form it is remarkable for the very strong and abrupt constriction of the pronotum anteriorly, and the very well-marked three-jointed antennal club. The eyes are large and prominent, the basal abdominal segment coarsely punctate even on the disc.

It varies in colour, clothing and size, in the relative length and width of the elytra and of the pronotum, and in the length and colour of the antennae. In some examples the constriction of the thorax is much less abrupt, and in extreme varieties almost or quite wanting.

The form with unicolorous red antennae and extremely abrupt constriction of the thorax may be distinguished as var. *adeloides*.

*Proterhinus adelus* var. *chrysadelus* var. nov.

Thorax and elytra evenly and similarly clothed all over with golden or greyish-golden squamosity, the whole insect reddish, except for some fuscous spots on the elytra, these spots being free from the appressed clothing. Antennae red at the base, dark apically. Thorax depressed in front and narrowed, sometimes more abruptly constricted, the posterior impressions faint or absent. Erect setae on elytra fine, white, long and conspicuous.

*Proterhinus adelus* var. *constricticeps* var. nov.

Head strongly transversely constricted behind the eyes. In other respects apparently not differing from some other specimens of *P. adelus*, some of which also show a tendency to constriction.

HAB. Oahu; this variable species occurs throughout the Koolau range.

(2) *Proterhinus maurus*, sp. nov.

Magnitudine grandi, robustus, niger, lobis tarsorum piceis aut obscure testaceis. Antennae subrobustae sed fortius elongatae, clava distincte 3-articulata; oculi permagni et fortiter prominentes. Pronotum parum squamosum, setis curvatis conspicue vestitum, antice fortiter impressum, post medium utrinque fortiter rotundatim foveatum, postice ad medium impressum, angulis posterioribus prominulis et macula albida ornatum. Elytra fusco-setosa, utrinque juxta scutellum ad basim tuberculata, post media setis albis bisignata, per grosse punctata, parum squamosa, angulis humeralibus fere rectis. Long. circiter 5 mm.

A most distinct species which cannot be confused with any other of the genus.

HAB. Oahu; Koolau range, 1800 ft. On *Pelea*.

(3) *Proterhinus echidna*, sp. nov.

Rufescens aut ferrugineus, elytris mediis utrinque nigro- vel fusco-notatis, antennarum clava nonnunquam obscuriore. Minus dense aureo- vel griseo-squamosus, elytris pedibusque setis gracillimis et perelongatis vestitis. Antennae graciles, elongatae, clava distincte 3-articulata, oculis prominentibus, magnitudine mediocribus. Pronotum antice fortissime impressum. Elytra latiuscula, lateribus rotundatis, angulis humeralibus acutis. Long. 2—3.25 mm.

A very distinct species by the extremely long, fine setae of the elytra and legs, the red colour of almost the whole insect, the deep thoracic impression and the shape of the elytra. Like other species of the genus, it varies in the development of the antennae, eyes, &c.

HAB. Oahu; mountains near Honolulu on *Gouldia*.

(4) *Proterhinus myrsineus*, sp. nov.

Rufescens, pronoto saepe infuscato, sive piceo, elytris nigro-notatis. Antennae longitudine mediocres, rufae, clava distincte 3-articulata. Pronotum parce squamosum, setis curvatis ad latera distinctis, antice constrictum et fortiter impressum, juxta medium impressionibus duabus rotundis distinctis, circa has impressiones densius squamosum. Elytra submaculatim pallide squamosa, setisque perconspicuis albidis et crassiusculis vestita, angulis humeralibus acutis et fortiter productis. Pedes et antennae rufi. Long. 2—3 mm.

The general red colour, the antennae and legs being red, the pronotum with a dense patch of appressed squamosity adjoining the circular impressions, the remainder being sparsely clothed, the very conspicuous erect white setae of the elytra, which have the humeral angles strongly produced, distinguish the species rather easily.

HAB. Oahu; mountains near Honolulu, 1500 ft., on *Myrsine*.

(5) *Proterhinus myrsineoides*, sp. nov.

Extremely similar to *P. myrsineus*, but the club of the antennae and sometimes some of the preceding joints are black or nearly so, the posterior round impressions of the pronotum are obsolete or very faint, their position being indicated by absence of squamosity, the femora are more infuscate, and the erect setae of the elytra are more elongate and slenderer. This insect also has a smoother appearance than the preceding.

One of the examples is larger than the others and the joints of the antennae are, as is often the case in other forms, longer and thinner than those of the smaller examples.

HAB. Oahu; Koolau range, 1500 ft., Waialua district.

*Proterhinus angularis* Sharp.

*P. angularis* Sharp, *huj. op.* II., p. 243.

It is now quite clear to me that the specimens from Oahu and all the windward islands that I referred to *P. angularis* S. are quite distinct from that species. *P. angularis* appears to be almost, if not entirely, confined to the mountains in the neighbourhood of Honolulu and is not very common. It is of depressed form, the elytra bear abundant and conspicuous fuscous erect setae. The antennae are always moderately elongate.

HAB. Oahu; mountains near Honolulu.

(6) *Proterhinus subangularis*, sp. nov.

To this form, for which I propose the specific name *subangularis*, belong nearly all the series of examples referred by me to *P. angularis* in F. H. II., 243. It is of narrow form, often extremely narrow, and is not so depressed as *angularis* and *subplanatus*. The elytra are conspicuously clothed with long white and dark erect setae. The antennae normally are long and slender and conspicuously setose. There is much variation in the shape of the thorax and the humeral angles differ in form in different examples. I suspect it will prove to be divisible into several distinct species or subspecies. It is a narrower insect than *P. obscuricolor* and the dark setae on the elytra are more developed. I have chosen a Molokai specimen as the type.

HAB. Oahu, Molokai, Maui, Lanai, Hawaii.

*Proterhinus obscuricolor* Perk.

*P. obscuricolor* Perk., huj. op. II., p. 202.

This form is no doubt exceedingly close to those which I assigned to *P. angularis* in my earlier collections. The limits of the species are at present uncertain and I assign to it diminutive examples, which certainly approach *P. subplanatus*, but I am not at all certain that careful study in the field will not show that these are distinct from either. From notes attached to some of these small examples I find that they were collected in the bark of twigs of *Pelea*, whereas *P. obscuricolor*, *P. angularis*, *P. subangularis* and *P. subplanatus* are certainly all attached to *Straussia*. In examples taken from *Pelea* the base of the elytra is usually dull red. The variation in the length of the antennae is very great.

HAB. Oahu; mountains near Honolulu.

*Proterhinus subplanatus* Perk.

*P. subplanatus* Perk., huj. op. II., p. 205.

Another very variable species of the *angularis* group, generally easily recognized by its depressed form, much less setose than true *angularis* and the entirely black or at least very dark antennae. It is very variable in the structure of the antennae, the joints having a strong tendency to become shortened.

HAB. Oahu; Koolau range, common beneath bark of *Straussia*.

*Proterhinus longulus* Sharp.

*P. longulus* Sharp, huj. op. II., p. 208.

Varies greatly in size, and in some examples the elytra are largely black. I have examined many examples, the species being very common on tree-ferns in the mountains throughout Oahu.

HAB. Oahu generally, from 1200 ft. upwards.



*Proterhinus denudatus* Perk.

*P. denudatus* Perk., huj. op. II., p. 203.

This may prove to be a variety of *P. longulus*. It differs chiefly in the white, not flavescent, erect setae of the elytra and in the darkened apical joints of the antennae, sometimes nearly all the joints are black. This species is extremely variable in size and structure, and it is almost impossible to decide as to its distinctness from *P. longulus*. It too is a fern feeder, and while not affecting tree-ferns, is found in the thin wiry stems of the so-called stag-horn fern. I have seen a few examples that I cannot certainly assign to either species.

HAB. Oahu; common in both ranges.

(7) *Proterhinus platygonioides*, sp. nov.

*P. platygoniadi* persimilis, sed capite post oculos haud fortiter constricto distinguendus.

Extremely like *P. platygonias*, but at once distinguished by the absence of the constriction behind the eyes. The species varies in size and colour. The antennae are sometimes entirely dark, sometimes entirely dull red, sometimes red at the base and black apically.

HAB. Oahu; Waianae mountains at 2000 ft.

*Proterhinus seticollis* Perk.

*P. seticollis* Perk., huj. op. II., p. 207.

I have examined a series of this species, of which none exactly resemble one of the original examples, which is available for examination, but, as they only differ slightly in colour and form, I believe I have assigned them correctly.

(8) *Proterhinus heterostictus*, sp. nov.

Further study and many additional specimens of the two species show that *P. heterostictus* considered in Vol. II., p. 205, as a variety of *P. vestitus* Sharp, is quite distinct from that species. The antennae are never of the clear red colour of true *vestitus*, but are either entirely black, or piceous, or have the basal joints only distinctly or obscurely red. Large examples of the species considered by me as *P. simplex* are excessively like some specimens of *P. heterostictus*, but the strong puncturation of the middle of the basal abdominal segment will distinguish the latter. Superficially some specimens are almost exactly like certain varieties of *P. adelus*, but the less marked club of the antennae will separate them.

HAB. Oahu; in the mountains behind Honolulu and elsewhere. The original specimens were from the Waianae mountains, where also I have since seen it.

*Proterhinus vestitus* Sharp.

*P. vestitus* Sharp, huj. op. II., p. 205.

This is a very distinct species with the antennae always unicolorous red, or at most a little darker apically and the pronotum generally abruptly constricted in front. It varies considerably in size, the antennae are sometimes shortened, and the proportion of black and red colour of the elytra is also variable. I have seen some specimens entirely red with only faint fuscous markings on the elytra. The species is very easily recognized.

HAB. Oahu; in the mountains around Honolulu, but I did not take it elsewhere on the island. It chiefly affects *Aleurites*, *Pipturus* and *Pisonia* and is not found on the highest peaks.

(9) *Proterhinus transversalis*, sp. nov.

Rufescens, thorace plus minusve infuscato, elytris nigro-maculatis, antennarum clava nigricante. Antennae graciles, fortius elongatae, clava 3-articulata; oculi minores. Pronotum parum latum, aureo-squamosum, antice fortissime transversim impressum, impressionibus posterioribus rotundis, minus profundis. Elytra latiuscula, remote punctata, setis albidis erectis perparce sed conspicue vestita, humeris fortiter acute productis. Long. ♀ circiter 2 mm.

This species is very distinct from any other on Oahu. The example examined is not quite mature and I suspect undersized; so that the characters observed are likely to be accentuated in larger individuals.

HAB. Oahu; Waianae mountains 2000 ft.

(10) *Proterhinus excrucians*, sp. nov.

Under the name of *P. simplex* Sharp I formerly placed a number of specimens, which I considered might be referred to that species as large and well-developed individuals. *P. simplex* was originally described from two apparently immature males, and other specimens afterwards sent over by Mr Blackburn were referred to it by Dr Sharp, though superficially at least they did not resemble the type. Whether Mr Blackburn ever obtained additional examples agreeing with the type is doubtful, and I have never myself seen any. I therefore propose the above name for the specimens which I formerly considered to be *P. simplex* S., as I no longer believe that the two are the same species. In any case *P. excrucians* remains so variable, even if the small and narrow examples be removed and considered as varieties of true *P. simplex*, that I am at a loss to characterize it better than I have already done under *P. simplex* in the earlier part of this work.

HAB. Oahu; abundant near Honolulu and throughout both mountain ranges.

(11) *Proterhinus facilis*, sp. nov.

Nigro-fuscus, thorace minus dense aureo-squamoso, antennarum articulis basalibus rufis. Oculi parvi; pedes graciles; pronotum antice tantum impressum. Elytra perparce squamosa, sed setis erectis albidis conspicue vestita, fortiter elongata, angulis humeralibus distinctis, fere rectis, vel leviter productis. Long. ♂ circiter 2 mm.

A very obscure species chiefly remarkable for its narrow form and the elongate elytra, which are nearly devoid of squamosity, but bear conspicuous white erect setae. The base of the elytra and sometimes some spots behind are obscure reddish in colour. The antennae are of moderate length, the club three-jointed, but its first joint is much less stout than the second. The legs are more slender than is usual in the genus.

HAB. Oahu, in both ranges, apparently rare.

*Proterhinus dispar* Sharp.

*P. dispar* Sharp, huj. op. II., p. 243.

Attached to *Wikstroemia foetida* and distributed all over the Koolau range of Oahu.

*Proterhinus obscurus* Sharp.

*P. obscurus* Sharp, huj. op. II., p. 210.

There is some doubt as to the identity of the type of this species with the examples, which I originally referred to it. It was described originally on a single female. As I understand it, after paying very special attention to the matter in the field, *P. obscurus* is a very variable species. The commonest form is a dark insect, the antennae being often entirely black or very dark red and the legs of the same colour or the basal joints of the former may be red, more frequently in the female. The elytra are usually obscurely red at the base and generally with other red markings posteriorly. These spots bear grey or golden squamosity. This form is extremely abundant on the 'Olomea' trees in the mountains round Honolulu and may be known as var. *perobscurus*.

Specimens collected from the 'Kalia' (*Elaeocarpus*) are altogether more rufescent and the legs are red, but I think they are the same species as the above, as intermediate forms occur. They may be known as var. *elaecarpi*.

At higher elevations and on another tree, which in the absence of my notes I cannot at present name, the insect becomes entirely or almost entirely red and is clothed all over with golden squamosity in fresh examples. The antennae are usually red on the basal joints only, or may be piceous throughout. The squamous clothing of the elytra is sometimes grey. This form may be known as var. *chryseis*.

HAB. Oahu; very abundant in the mountains round Honolulu, and widely distributed.

*Proterhinus oscillans* Sharp.

*P. oscillans* Sharp, huj. op. II., p. 210.

This species is not very variable and is rather easily recognized, though very closely allied to *P. deceptor*, *P. subdeceptor* and others. It is generally distributed over Oahu in both ranges and is attached to *Acacia koa*.

*Proterhinus pachynemis* Perk.

*P. pachynemis* Perk., huj. op. II., p. 211.

The female of this species, which was not contained in my earlier collections, resembles the male in general appearance, but lacks the enormous development of the femora. It may, however, be easily recognized by the long second joint of the antennae, which is as long as or longer than, the third and is much stouter than the latter.

*Proterhinus deceptor* Perk.

*P. deceptor* Perk., huj. op. II., p. 245.

This species is common in the Koolau range of Oahu, near Honolulu and elsewhere and, no doubt, in my earlier collections I referred examples of other species to it. It affects the lower altitudes in the mountains and is abundant on the Hau tree (*Hibiscus tiliaceus*). I have now examined many examples and the variation does not seem to be excessive.

HAB. Oahu; common and generally distributed.

(12) *Proterhinus subdeceptor*, sp. nov.

This species is almost similar to *P. deceptor*, but having examined a very fine series, I find that it is evidently more elongate; the elytral clothing has not the same tendency to form spots and the erect setae are less developed, less numerous, and almost confined to the posterior parts of the elytra.

The colour of the elytra is usually red or reddish, with black or fuscous marking each side, often forming a median band. In small dark specimens nearly the whole of the elytra is occupied by this black colour except the basal third. The pronotum is very densely clothed at the sides with appressed pale squamosity, and very rarely it is almost equally dense between these areas. Usually a number of the basal joints of the antennae are clear red, but sometimes only the scape is of this colour, while in others the antennae are entirely black.

HAB. Oahu; widely distributed in the Koolau range. I have taken it commonly from stems of *Alyxia*.

(13) *Proterhinus pipturi*, sp. nov.

Rufescens vel sordide rufus, elytrorum marginibus et saepe maculis dorsalibus nonnullis nigricantibus aut fuscis, pedibus rufis, nonnunquam sordidioribus, antennis clare rufis, apices versus nigris. Pronotum aureo-squamosum, lateraliter plaga densiore utrinque vestitum. Oculi minores; antennae graciles, fortius elongatae, articulo primo robusto et elongato, tertio gracili, elongato, quam quartus multo longiore, clava distincte 3-articulata. Articulus tarsorum anticorum lobatus sat magnus. Elytra plerumque maculatim squamosa, setisque erectis albidis subconspicue vestita, angulis humeralibus haud productis. Long. 1.75—2.25 mm.

This small species is best distinguished by the more than usually elongate antennae, with clear red basal joints. The elytra in fresh examples bear more or less distinct roundish spots of pale squamosity and in most individuals, especially of the male sex are rather wider towards the base than in most species. These characters and the rufescent colouring render this species rather easy to distinguish.

HAB. Oahu; mountains near Honolulu 1200—1800 ft. Attached to *Pipturus*.

*Proterhinus vicinus* Perk.

*P. vicinus* Perk., huj. op. II., p. 212.

I have examined many additional specimens of this small species. It varies in colour, in the shape of the prothorax and in the length of the antennae, while very rarely these are entirely black. The series now before me were all taken in the same locality and at the same time. Whether the species is really distinct from some of the allied species on Kauai is at present uncertain owing to the great variability.

*Proterhinus pusillus* Sharp.

*P. pusillus* Sharp, huj. op. II., p. 212.

I have considered a long series of specimens, collected from all parts of Oahu, to be the above species. The variation is considerable; the legs may be entirely black or entirely red, or red in parts. The antennae are often wholly black or dark-coloured, or they may be black, with the base red. The beetle itself varies in colour from black to reddish. The pronotum has always a dense patch of squamosity along the sides, and is much wider in some examples than others, as is also the case with the elytra.

*P. pusillus* var. *subpusillus* var. nov.

This form may be a distinct species; it is usually narrower than the typical form, the elytra are generally for the most part dull red, and the dense patches of squamosity at the sides of the pronotum are dilated or curved inwards at about the anterior third of its length and may even meet there. This variety is common in the Waianae range.

HAB. Oahu; in all localities from 1500 ft. upwards. Attached principally, if not solely, to *Pelea*.

(14) *Proterhinus minimus*, sp. nov.

Rufescens, elytris utrinque saepius nigro- vel fusco-notatis, antennis apices versus nigricantibus, elytris setis erectis gracilibus parce vestitis. Antennae crassiusculae, clava 3-articulata. Pronotum antice impressum, lateribus plaga densiore squamosa ornatis. Elytra parce squamosa, angulis humeralibus distinctis, sed haud acute productis. Long. 1.5—2 mm.

One of the smallest species of the genus, best recognized by the red colour, small eyes and tarsal lobes, the sparse and rather fine erect setae of the elytra, the dense patch of squamosity on either side of the pronotum, and the form of the antennae. The scape in the male is large for the size of the insect and the funicle joints are thicker than usual, giving the antennae a rather stout appearance. Two abraded specimens with entirely red antennae may also belong to this species.

HAB. Oahu; mountains near Honolulu; probably rare.

*Proterhinus blackburni* Sharp.

*P. blackburni* Sharp, huj. op. II., p. 246.

Common throughout both ranges of Oahu on many kinds of forest trees as well as ferns.

*Proterhinus archaeus* Perk.

*P. archaeus* Perk., huj. op. II., p. 209.

In both mountain ranges of Oahu; common in the Koolau range near Honolulu and elsewhere. Often under bark of *Straussia* with *P. subplanatus*, but also on *Pelea* and other trees.

## STREPSIPTERA.

By R. C. L. Perkins.

(1) *Elenchus melanias*, sp. nov.

Thorax dull brown or pitchy, head black or nearly so, abdomen black, tips of the joints of anterior tarsi pallid. Lateral branch of antennae extending nearly to their tip, second joint subglobose or subquadrate in different aspects, paler generally than the following. Wings very dark smoky black, apical dilatation of elytra deep black. Abdominal segments with interrupted white apical margins. Genital segment more or less pale within, rather broad where the sides are well angulated in front of the middle, chitinous recurved hook dilated apically and terminated in a very minute pale upturned spine. Expanse 3.3 mm.; length 1.5 mm. Male.

*Elenchus melanias* var. *silvestris* var. nov.

Very like the above, but with the wings less deeply smoke-coloured, and the genital segment more elongate in proportion to its width. This variety also appears to be slightly smaller than the type.

HAB. Oahu, Hawaii, and females on all the other islands. The typical form described has been taken in more open country and the var. *silvestris* in very dense, wet forests. It infests Delphacid leaf-hoppers of many species and of different genera. The var. *silvestris* approaches most nearly to *E. tenuicornis*, but the difference between Hawaiian specimens and the examples I refer to the latter from Europe, America, Fiji and Australia is much greater than any distinction between the individuals of *E. tenuicornis* from the above named, widely separated regions.





## THYSANOPTERA.

By **Richard S. Bagnall, F.L.S., F.E.S.**

Contents: 1, General Remarks; 2, Systematic Account.

### 1. *General Remarks.*

The insects of the order Thysanoptera are perhaps less studied than those of any other well-defined group. This is partly accounted for, perhaps, by the fact that they require special collecting and preserving, and partly also by the minute size of most thrips. Whilst the Thysanopteron is difficult to understand morphologically and certain parts are yet but incompletely understood, it is recognized, and has for some time been recognized, as an insect of decided economic importance, and in view of this it is indeed strange that the order should have been so long neglected by entomologists. The pioneer work of Haliday, Heeger, Jordan, Uzel, Reuter, Trybom, Hinds, is bearing fruit, however, and to-day many entomologists (though fewer than we would wish) are energetically working at the Thysanoptera<sup>1</sup>.

It is only recently that the forms outside of the Palaearctic and Nearctic regions have received attention, but from material we have examined from India, the Malay Archipelago, Africa, Central America, etc., it is evident that the Thysanopterous fauna of the tropical and sub-tropical regions will prove to be a very rich one. And it is only natural to suppose that wherever a district is botanically rich, it will also be wealthy in these insects, the majority of which infest flowers and leaves of different plants.

They should be searched for on and under the leaves and stalks of all grasses, ferns, flowering plants, shrubs and trees; in flowers, on lichens, amongst moss, etc., and under bark of decaying trees; a few forms are found in galls and others live in fungoid growths. Most thrips live gregariously and all stages are frequently found together.

<sup>1</sup> Trybom (Sweden); Karny and Schmutz (Austria); Buffa (Italy); Crawford, Franklin, Hood and Moulton (U.S.A.).

If carded these insects dry and curl up very quickly and are of but little use for study, it is therefore necessary to collect them by means of a small camels' hair brush into a weak solution of formalin, or in from 60 to 70 % alcohol. The majority of flower-living thrips are very small—not infrequently less than a millimetre in length—and therefore require careful search. The best plan is to shake plants, leaves, flowers, etc., or the contents of one's sweep-net, on to a sheet of white paper, where the most minute insect can be readily seen as soon as it moves.

As might have been expected, excepting for the description of two species given in a recent short paper by the late Mr Kirkaldy, the Thysanoptera of the Hawaiian Islands are unknown. The material upon which the present contribution is based has all been collected by Dr R. C. L. Perkins, and consists chiefly of about seven dozen dried and mounted specimens, though later a small collection in alcohol was submitted; and because of the difficulty of satisfactorily dealing with dried material this latter collection, though small, has been very helpful indeed<sup>1</sup>.

Altogether twenty-one species are recorded; fifteen of these are new; two are those described by Kirkaldy, whilst the other four are well-known pests and two of them almost cosmopolitan in their distribution. This is probably only a small proportion of the Hawaiian Thysanoptera; it is quite possible that energetic and systematic search, giving particular attention to the minute forms attached to the various plants, will bring to light five or six times this number.

Further and considerable material would be very useful and welcome; not only will new forms be discovered but we shall be able more fully and perfectly to describe some of those species which through lack of material have herein been erected on single and, in more than one case, imperfect specimens.

It is evident that the Thysanopterous fauna of the Sandwich Isles is by no means poor. In his Presidential Address for 1906, to the Hawaiian Entomological Society, taking as his subject the "Insects at Kilauea, Hawaii<sup>2</sup>," Dr Perkins in speaking of the Thysanoptera says that, as everywhere in the islands, they are very abundant and the species are probably numerous.

**Distribution.** A study of the distribution of these insects in the islands forming the Hawaiian group cannot but be interesting. The chief feature lies in the number of species that are peculiar each to a certain island, a feature already strongly shown in other groups of more familiar insects and which, though shown perhaps in an exaggerated form here owing to want of material, will we think be substantiated to a large extent when the Thysanopterous fauna is better known. Under the name of each island we

<sup>1</sup> We are indebted to Mr Dudley Moulton for the records of *Heliothrips rubrocinctus* and *Scolothrips 6-maculatus*.

<sup>2</sup> Proc. Hawaiian Ent. Soc., vol. 1. pt. 3, p. 89.

give a list of the known thrips, drawing attention to the precinctive forms, and following this up by a table showing the distribution, and by general remarks on the distribution.

KAUAI. It will be seen from the following list that no species herein recorded are peculiar to Kauai; all of these occur also on Hawaii, and the three last-named are apparently introduced forms.

*Dermothrips hawaiiensis* (forma *aptera*), *Heliothrips haemorrhoidalis*, *Thrips multispinus* and *Limothrips cerealium*.

OAHU. The following species are recorded from the Island of Oahu; the macropterous form of *Dermothrips hawaiiensis*, *Oedemothrips laticeps*, *Nesothrips oahuensis*, *Dolerothrips bicolor*, *Trichothrips nigricans*, *Agnostochthona alienigra*, *Diceratothrips brevicornis*, *Heliothrips rubrocinctus* and *Scolothrips 6-maculatus*.

A total of nine species, of which *Oedemothrips laticeps*, *Nesothrips oahuensis*, *Dolerothrips bicolor*, *Trichothrips nigricans*, *Agnostochthona alienigra*, *Diceratothrips brevicornis*, *Heliothrips rubrocinctus* and *Scolothrips 6-maculatus* are peculiar to the island. Of these *Heliothrips rubrocinctus* and *S. 6-maculatus* are introduced species, *Diceratothrips brevicornis* is most probably not indigenous, and the type specimens of *Dolerothrips bicolor*, *Trichothrips nigricans* and *Diceratothrips brevicornis* are unique.

MOLOKAI. *Dolerothrips angusticeps*, *D. lanaiensis*, *D. dubius* and *Thrips multispinus* are all we are able to record from Molokai. The first-named is peculiar to that island.

LANAI. *Dolerothrips perkinsi*, *D. dubius* and *D. lanaiensis* are the only forms received from Lanai; *D. perkinsi* is unique and therefore peculiar to the island, whilst *lanaiensis* is apparently a common form on Lanai but occurs more sparingly on Hawaii and Molokai also. *D. dubius* also occurs on Hawaii and Molokai.

MAUI. This Island possesses four species: *Dermothrips hawaiiensis* (forma *aptera*), *Dolerothrips flavipes*, *D. ovatus* and *D. intermedius*. All excepting *Dermothrips* are peculiar to Maui; *Dolerothrips flavipes* and *D. ovatus* are well-marked species and apparently common in the island; the type specimen of *D. intermedius* is unique.

HAWAII. *Dermothrips hawaiiensis* (forma *aptera*), *Dolerothrips barbatus*, *D. lanaiensis*, *D. dubius*, *Trichothrips laticornis*, *Anthothrips usitatus*, *Heliothrips haemorrhoidalis*, *Thrips multispinus* and *Limothrips cerealium* are recorded from this island.

*Dolerothrips barbatus*, *Trichothrips laticornis* and *Anthothrips usitatus* are peculiar to the island and the type specimens of the first two are unique.

*Heliothrips haemorrhoidalis* and *Limothrips* are pests of wide distribution, whilst *Anthothrips usitatus* and *Thrips multispinus* are probably, almost certainly, not endemic forms though their introduction may date a long time back.

Table showing the species and their distribution in the islands :

Name of Species	Kauai	Oahu	Molokai	Lanai	Maui	Hawaii
TUBULIFERA						
* <i>Dermothrips hawaiiensis</i> , forma aptera ...	+	—	—	—	†	+
* " " " macroptera	—	+	—	—	—	—
* <i>Oedemothrips laticeps</i> ...	—	+	—	—	—	—
* <i>Nesothrips oahuensis</i> ...	—	+	—	—	—	—
* <i>Dolerothrips barbatus</i> (m) ...	—	—	—	—	—	+
* " flavipes ...	—	—	—	—	+	—
* " ovatus ...	—	—	—	—	+	—
* " perkinsi (m) ...	—	—	—	+	—	—
* " angusticeps ...	—	—	+	—	—	—
* " bicolor (m) ...	—	+	—	—	—	—
* " intermedius (m) ...	—	—	—	—	+	—
* " lanaiensis ...	—	—	+	+	—	+
* " dubius ...	—	—	+	+	—	+
* <i>Trichothrips laticornis</i> (m) ...	—	—	—	—	—	+
* " nigricans (m) ...	—	+	—	—	—	—
* <i>Agnostochthona alienigra</i> ...	—	+	—	—	—	—
<i>Anthothrips usitatus</i> ...	—	—	—	—	—	+
<i>Diceratothrips brevicornis</i> (m) ...	—	+	—	—	—	—
TEREBRANTIA						
† <i>Heliothrips haemorrhoidalis</i> ...	+	—	—	—	—	+
† " rubrocinctus ...	—	+	—	—	—	—
<i>Thrips multispinus</i> ...	+	—	+	—	—	+
* <i>Scolothrips 6-maculatus</i> ...	—	+	—	—	—	—
† <i>Limothrips cerealium</i> ...	+	—	—	—	—	+

In the above table those marked with an asterisk may be regarded as endemic, whilst a † indicates species of economic importance that have almost certainly been introduced.

The genera *Dermothrips*, *Oedemothrips*, *Nesothrips*, *Dolerothrips* and *Agnostochthona* are peculiar to the Hawaiian Islands; of these *Dermothrips* and *Oedemothrips* are striking forms bearing no very close relationship with any allied genera; *Dolerothrips* very closely approaches *Trichothrips* and its allies. We do not know *Nesothrips*

and *Agnostochthona* except from Kirkaldy's description, from which *Agnostochthona* would appear to be an *Anthothrips*, and *Nesothrips* would appear to come near *Oedemothrips*; the species of the genera *Trichothrips*, *Anthothrips* and *Thrips* are world-wide in their distribution.

A large proportion of species are each peculiar to one particular island; such are denoted in the table by their names appearing in black type instead of in italics. Now, probably owing to the comparative paucity of material, we have had to describe a number of unique types (these being denoted by an "m" in parenthesis), but even taking these into consideration we find several outstanding features worthy of note, though we are not yet in a position to make generalisations with any degree of certainty. The first and perhaps most striking feature is in the distribution of *Dermothrips*. The wingless form is found more or less commonly in three islands, including the two most widely separated islands, Kauai and Hawaii, whilst the winged form is found in a fourth island, Oahu. No winged examples have been taken in any one of the islands where the wingless form occurs, whilst the winged form which is larger and more robust than the wingless form, is peculiar to Oahu, where the wingless form is unknown. We might, in fact, regard this macropterous form as a distinct local race.

The preponderating genus is *Dolerothrips*, and of the nine described species seven are confined each to a single island, whilst *lanaiensis* is, one might almost say, peculiar to Lanai, as the specimens recorded from Molokai and Hawaii are referred to that species with some little doubt. *D. dubius* occurs in the same islands as *lanaiensis*.

Neither *Dolerothrips* nor any of its allied genera is represented in Kauai, in fact *Dermothrips* is the only Tubuliferon we are able to record from that island; but three Terebrantians (in two cases, if not all, introduced) occur, these same species being found again in Hawaii.

So far we can only regard *Heliothrips haemorrhoidalis*, *H. rubrocinctus* and *Limothrips cerealium*, and more doubtfully *Anthothrips usitatus*, *Scolothrips 6-maculatus* and *Thrips multispinus*, as important from an economic point of view.

It is unfortunately certain, however, that more of these little pests exist, and unknown and unseen are causing damage in a greater or less degree upon the various valuable crops that are being cultivated in the Hawaiian Islands.

As an illustration of the decided economic importance of the Terebrantian Thysanoptera we might instance the Pear thrips, *Euthrips pyri* Dan. In 1895 this species appeared in such great numbers as to cause extensive damage to hundreds of acres of orchards in California, and ever since then it has occupied the attention of several American economic entomologists. Only last year we recorded its appearance in Great Britain<sup>1</sup>, and within a year of its appearance we learn that much damage has been done to many pear and plum orchards in the south of England. Like most, if not all Thysanoptera, *E. pyri* is parthenogenetic, and in the countless thousands of Californian specimens examined not a single example of the male has been discovered;

<sup>1</sup> Bagnall, Journal of Economic Biology, LV. pt. 2.

amongst those found in England, however, we have detected a solitary example of that sex.

**Vestigial Wings, etc.** A distinct feature in the Hawaiian Thysanoptera is the exceptionally large proportion of apterous species or species wherein the wings have been reduced to a functionless pad. In the truly wingless species we find that the ocelli are absent, whereas in the brachypterous forms the ocelli are seldom if ever entirely lost. In some species of *Dolerothrips* the wings are reduced to such an extent that it is only by careful microscopical examination that the minute bristle-set scale-like pad can be distinguished, but in all species the ocelli are well-developed, larger than is usual in brachypterous forms.

*Dermothrips* is purely an apterous form on the islands Kauai, Maui and Hawaii, but, as mentioned before, a large winged form is peculiar to a fourth island, Oahu.

Unfortunately the material is not sufficient to warrant one in theorising on these interesting questions.

**Taxonomy.** Perhaps one of the greatest drawbacks in the study of the Thysanoptera is the want of definition in specific and generic characters. After the main divisions, which are comparatively well-marked, it has as yet been impossible to lay down any plan by which the genera may be readily and naturally divided on workable characters such as exist in, we think, all other orders. For instance in the Coleoptera we have well-marked and invaluable means of systematic grouping in such parts as mouth organs, the feet, the sternum, the abdomen, the genitalia, etc., whilst in other orders these and other parts such as wing-venation, antennal characters, etc., are equally important. Nor do the species of this order possess structural characters such as those so beautifully exemplified in that group of primitive soft-bodied wingless insects, the Collembola or Springtails, wherein we find the structure of the spring and foot, the eye-spots, etc., a very valuable aid to identification.

In fact we find several features, important in most orders, of little taxonomical importance in the Thysanoptera excepting perhaps in diagnosing the subordinal divisions. These remarks apply particularly to the sub-order Tubulifera, which so far as the Hawaiian fauna is concerned affect us more closely than the Terebrantia.

In the Terebrantia certain characters have been used in the separating of the two families *Aeolothripidae* and *Thripidae*, such as the form and segmentation of the antennae and the form of ovipositor in the female, but recent researches have brought to light several forms possessing antagonistic characters which have somewhat weakened their value. Nevertheless, compared to the Tubulifera, the insects of the sub-order Terebrantia are not so difficult to group systematically.

The satisfactory generic grouping of the species of the sub-order Tubulifera is one of much difficulty. The parts, as we have said already, that in many orders exhibit invaluable characters for the satisfactory and natural grouping of the species, are in this

sub-order chiefly remarkable by their similarity and want of definition. Thus the sternum, the mouth parts, the feet, the antennae and the wings can only play a comparatively unimportant part in the systematic arrangement of these insects. It is true that there are certain well-defined genera or groups of genera, such as *Megalothrips* Targ.-Tozz., and allies, wherein the sixth abdominal segment is laterally produced in the male; *Macrothrips* Bagnall and *Ecacanthothrips* Bagnall wherein the fore-coxae are curiously produced; *Dinothrips* Bagnall, remarkable for the bifurcate lateral mesothoracic appendages in the male; *Polyommatothrips* Buffa possessing the eyes large and contiguous or apparently so, and *Ecacanthothrips* and *Eupathithrips* Bagnall each having a distinctive and peculiar type of antennal sense-organ; but the fact remains that as a whole the sub-order is a difficult one to understand and classify.

Again we find instances of two groups of species which may be separated easily by the naked eye or under a comparatively low-power lens, but though one can have little doubt as to the distinctness of the two so-formed genera, yet the differences are exceedingly difficult to convey in words. Such is the case in the genera *Idolothrips* and *Dicaiothrips* Buffa. We have had a number of species of both genera through our hands from Central America, the Malay Archipelago and Africa, and whilst satisfied as to the value of the genera, we have found it very difficult to formulate the common characteristics of each genus.

As to specific characters, the relative length of the head and prothorax, and of the tube compared to its breadth at base and to the length of head and sometimes to the length of preceding segments, are apparently good characters in most genera. In our table of the genus *Dicaiothrips* in a recent paper on Neotropical Tubulifera<sup>1</sup> we found these characters invaluable; and the relative lengths of the seventh and eighth abdominal segments were also helpful.

We are, in a manner of speaking, in the early stages of this study, and it is therefore essential that all authors should describe and figure each species fully, and in addition briefly compare them with their allies.

**Chaetotaxy.** The number, form and arrangement of bristles on the head, prothorax and abdomen will prove to be characters of some taxonomical importance in the Tubulifera as well as in the Terebrantia, and it is well to draw attention to the chaetotaxy.

As an illustration we find in the genus *Dicaiothrips* already referred to that the post-ocular bristles are always present in the female but usually though not always absent in the male; thus we have found a useful character in our table of the Neotropical *Dicaiothrips*.

In the material now before us we may draw attention to certain features relative to the subject. *Dermothrips* (with one other known Phloeothripid genus) is peculiar on

<sup>1</sup> Bagnall, Journal Linn. Soc., Zoology, xxx. pp. 369—387, pl. 51—53, 1910.

account of the usual bristles being obsolete, thus approaching the condition seen in the *Urothripidae*; whilst *Dolerothrips* possesses a character common to all the species in the fore-coxa, which, instead of being furnished with one prominent bristle is very strongly spinose. In all the species of this latter genus too, we notice that the mid-lateral, posterior-marginal pairs of bristles and the pair at posterior angles of prothorax are more or less well developed, whilst the anterior-marginal and pairs at anterior angles are either poorly developed or obsolete.

In tabulating the species of *Dolerothrips* we have found characters connected with the bristles of decided importance; thus in *D. perkinsi* the lateral bristles of the eighth abdominal segment have been considerably reduced, in *D. intermedius* all the bristles are much shorter than in other species, excepting the extreme and interesting form *lanaiensis* wherein all the bristles are very weak and greatly reduced, approaching the condition seen in *Dermothrips*.

## 2. Systematic Account.

### Order THYSANOPTERA.

Insects of the order Thysanoptera possess certain features which at once separate them from all orders; principally the semi-mandibulate and semi-suctorial mouth; the fringed wings and the bi-articulated foot, which latter is furnished with a retractile bladder-like organ, a characteristic embodied in the ordinal name Physapoda, a name adopted by many entomologists.

It is beyond the scope of the present contribution to go into the details of the anatomy, nor is it necessary when one can consult the excellent works of Haliday, Jordan, Uzel and Hinds<sup>1</sup>. But recently we have had the pleasure of describing a new type of Thysanoptera, *Urothrips paradoxus* Bagnall, differing in so many points from all other forms as to modify considerably our ideas as to the relationships and phylogeny of the thrips, and also their systematic arrangement; therefore, whilst adopting Haliday's very convenient classification herein, we cannot pass unnoticed an insect that will without doubt be an important factor in the future classification of the order<sup>2</sup>.

*Urothrips*, whilst undoubtedly Tubuliferan in its affinities, differs from all known forms in both divisions of the Thysanoptera by the possession of single-jointed maxillary and labial palpi; of eleven pairs of well-developed stigmata instead of four pairs;

<sup>1</sup> Haliday, Entomological Magazine, III. pp. 439—451, 1837, and in Walker's Homopterous Insects, Brit. Mus. pt. IV. pp. 1094—1118, 1852; Hinds, Proc. U.S. Nat. Museum, XXVI. pp. 79—242, 1902; Jordan, Zeitschrift f. wissensch. Zoologie, XLVII. pp. 541—620, 1888; Uzel, Monographie der Ordnung Thysanoptera, 1895.

<sup>2</sup> Bagnall, Annales Musei Nationalis Hungarici, VII. pp. 125—136, pl. III. 1909.



of whip-like terminal hairs in the male ; and by the fact that the posterior pair of coxae instead of the intermediate pair are the most widely separated. The antennae, too, are distinctly typical in the family Urothripidae.

The sub-orders may be tabulated as follows :

- I. Female without an ovipositor ; last abdominal segment tubular in both sexes.  
Lower and upper wings, when present, similar in structure, with only one (partially developed and sometimes obsolete) median longitudinal vein which never reaches to tip of wing .....Sub-order **Tubulifera**.
- i. Eleven pairs of stigmata present ; hind pair of coxae most widely separated.  
Antennae broad, seven-jointed. Ninth abdominal segment elongate, longer than preceding ; intermediate terminal hairs obsolete. Terminal hairs in male whip-like, in female simple .....Fam. *Urothripidae* Bagnall.
- ii. Four pairs of stigmata present ; intermediate pair of coxae most widely separated. Antennae more or less slender, eight-jointed, joints elongate. Ninth abdominal segment transverse, as long as or shorter than the preceding ; intermediate terminal hairs present, terminal hairs simple in both sexes<sup>1</sup> .....Fam. *Phloeothripidae* Haliday.
- II. Female with a saw-like ovipositor ; last abdominal segment of female usually conical ; that of male rarely like the female's, but usually bluntly rounded. Fore-wing with at least one longitudinal vein reaching from base to tip of wing .....Sub-order **Terebrantia**.
- i. Antennae nine-segmented. Wings (when present) broad and rounded at the tips ; fore-wings with cross veins. Ovipositor of female up-curved. Maxillary palpi geniculate, three- to seven-segmented ; labial palpi two-, four- or five-segmented .....Fam. *Aeolothripidae* Haliday.
- ii. Antennae six- to eight-segmented. Wings (when present) usually narrow and pointed at tips, without cross veins. Ovipositor of female down-curved. Maxillary palpi non-geniculate, two- or three-segmented, labial palpi always two-segmented .....Fam. *Thripidae* Haliday.

Only the latter family of each sub-order is represented in the Hawaiian fauna ; representatives of the family Aeolothripidae may however be met with when further attention is given to the order.

We should here draw attention to the genus *Heterothrips* Hood, the species of which possess characters common to both families, and also to certain anomalous Indian and African material in our possession.

Sub-order *TUBULIFERA* Haliday.

Fam. *PHLOEOTHRIPIDAE* Haliday.

*DERMOTHRIPS*, gen. nov.

Surface rough and dull ; head, prothorax, fore-coxae and all femora strongly scabrous.

<sup>1</sup> These characters in the main part apply also to species of the Sub-order Terebrantia.

Head large, longer than broad and nearly twice as long as the prothorax; cheeks parallel, roundly constricted at base. Antennae one and one-half times the length of the head, joints six to eight closely segmented. Mouth-cone rounded at tip, almost as long as the prosternum. Eyes small; ocelli absent in wingless forms, present but very small in winged forms; post-ocular spines absent.

Prothorax small, transverse; pterothorax transverse. Wings, when present, long and slender; fore-wing with a strong median vein the basal half of which is transversely ridged. Fore-coxa without a prominent spine, fore-tarsus unarmed in the female.

Abdomen elongate-ovate, much broader than the pterothorax; all bristles (excepting those at tip of tube) obsolete.

Male one-third smaller than the female, having the abdomen more slender and distinctly linear, the fore-leg stouter and the fore-tarsus armed with a tooth.

Species small.

Type. *Dermothrips hawaiiensis* mihi.

(1) *Dermothrips hawaiiensis*, sp. nov.

Forma aptera.

Plate XVII. figs. 1—5.

♀. Length 2.0 mm., breadth of mesothorax 0.43 mm.

Colour uniform dull black, tarsi tinged with brown.

Head one and one-third times as long as broad and not quite twice as long as the prothorax; cheeks sub-parallel and rounded near base; vertex slightly raised between eyes. Eyes coarsely faceted, small, occupying laterally a little more than one-fifth the total length of the head; yellowish-brown in the dried specimens. Ocelli and post-ocular spines absent. Width between the eyes a little more than two and one-half times the width of an eye. Antennae one and one-half times the length of the head, separated at their bases and inserted on a raised prominence; second joint distally truncate, third to fifth clavate and sixth to eighth closely segmented; third joint one and one-half times the length of second; fourth, four-fifths of third; fifth, seven-eighths of fourth; sixth equal in length to the fifth, constricted at base and truncate at apex; seventh less than half the length of the sixth, and apical joint three-quarters the length of the seventh, the three apical joints together narrowing from about middle to tip. Sense-cones long and slender, a pair on each of the joints three to five, but apparently only one on the sixth joint, which is on the inner side of tip. In some specimens there appears also to be a long, slender sense-cone on the seventh joint at the tip within. Mouth-cone rounded at tip, three-quarters as long as wide at base and not quite reaching across the prosternum; labrum pointed. Surface of head scabrous, the irregular ridges most conspicuous laterally and taking the form of numerous small tubercles, each set with a weak and minute seta.

Prothorax transverse, only one-half as long as broad; setae obsolete excepting the posterior-marginal pair which are short and weak. Surface roughly sculptured with the disc irregularly depressed. Pterothorax as wide as the width across fore-coxae, about three-quarters as long as broad; fore-part of mesothorax scabrous, dorsal surface squamose and metathorax reticulated. Legs somewhat short, all femora slightly swollen; fore- and intermediate-coxae strongly projecting, fore-coxa scabrous, without any prominent bristle, and fore-tarsus unarmed. Sculpture of all femora the same as that of the head, all tibiae less markedly scabrous and more strongly and regularly setose.

Abdomen oblong-ovate, one and two-thirds as broad as the pterothorax, widening from base to the fourth segment and narrowing from the sixth segment to base of tube. Surface shagreened, very sparsely, irregularly and minutely setose; the second segment, a good part of the third and the sides of the succeeding segments having a squamose appearance as in the pterothorax. Tube about two-thirds the length of the head and about two and one-half times as long as broad at base, narrowing from apical third to tip, where it is only one-half as broad as at base. Surface of tube smoother and more shining than the rest of the abdomen, and showing signs of reticulate sculpture. Terminal hairs a little more than one-half the length of the tube; all abdominal hairs very weak and minute.

♂. Length 1.5 mm. There is a single specimen of what is apparently the male of *Dermothrips hawaiiensis*. It is only about three-quarters the average length of the female, and is much narrower in comparison to the length, having the abdomen linear and only about one and one-quarter times as broad as the pterothorax. The fore-leg is stouter, and the tarsus is armed with a short tooth. The tube is comparatively longer and narrower.

#### Forma *macroptera*.

♀. Length 2.1 to 2.5 mm. The winged form is on an average distinctly larger than the wingless specimens. The pterothorax is developed, whilst the abdomen is furnished with wing-retaining spines. The eyes are comparatively larger; the ocelli are present though very small, the posterior pair being on a line drawn through the posterior third of eyes, and near to their inner margins. The wings are long and narrow, reaching the ninth abdominal segment. They are of a smoky colour with a dark vein running for more than one-half the length, this vein being ridged for a little more than half its length from the base. In the specimens examined, all of which come from the island of Oahu, the wings lie so closely to the abdomen and seem so slender in comparison to the heavy body, as to suggest long disuse.

HAB. Kauai, Oahu, Maui, Hawaii.

Forma *aptera*, ♀. Hawaii, Kona, one specimen at 3000 feet and two others at 2000 feet, September 1892 (Perkins, Nos. 203 and 206); Kilauea, two, July 1895 (No. 531), two, August 1895 (Nos. 532 and 603), one, August 1896 (No. 656), and three at 4000 feet, September 1896 (No. 695). Kauai, Mounts. Waimea, six specimens at 4000 feet, June 1894 (No. 285). Koholuamano, one specimen, April 1895 (No. 523) and Makaweli, one at 2500 feet, February 1897. Maui, Haleakala, three specimens, over 5000 feet, October 1896 (No. 636). ♂. Kauai, one specimen at 4000 feet, October 1895 (No. 560).

Forma *macroptera*, ♀. Oahu, Waianae Mountains, one specimen at 2000 feet, April 1892 (No. 14); Mountains near Honolulu, two at 2300 feet, July 1900 (Nos. 667 and 786) and another specimen, back of Tantalus (mt.), November 1900 (No. 784).

OEDEMOTHRIPS, gen. nov.

Surface highly polished and shining.

Head scarcely as long as broad, slightly widened anteriorly. Antennae twice as long as the head. Mouth-cone broadly rounded, reaching about three-quarters way across the prosternum. Eyes small, ventrally produced posteriorly; space between them great. Ocelli absent; post-ocular spines long.

Wings absent. Legs moderately long and strong, fore-femur in the female very slightly longer than the tibia, and fore-tarsus unarmed (excepting the minute distal tooth).

Abdomen broad, lateral and sub-lateral bristles long and slender.

Male with the prothorax and fore-femora much enlarged and inflated, fore-tibia about two-thirds the length of the femur, and tarsus armed with a strong tooth.

Species small.

Type. *Oedemothrips laticeps* mihi.

(1) *Oedemothrips laticeps*, sp. nov.

Plate XVII. figs. 6—10.

♀. Length 1.5 mm., breadth of mesothorax 0.375 mm.

Colour shining black, polished; fore-tibia red and tarsi brownish, antennae with the second and third joints brownish, the third being yellow at base. Surface polished, especially the prothorax, head and femora.

The head is about as long as broad, widest across eyes; frons raised and rounded, and the cheeks, which are furnished with two or three minute setae, narrowed slightly from behind the eyes to base. Eyes small and moderately finely faceted, occupying laterally about one-quarter the length of the head, the space between them being about

three times the width of an eye. Surface highly polished and shining, and faintly and finely reticulated near neck. Ocelli absent; post-ocular bristles very long, and a pair of shorter bristles between eyes. Mouth-cone broadly rounded and reaching for about three-quarters the length of the prosternum. Antennae more than twice as long as the head, separated at base; second joint constricted at base, cyathiform; joints three to five claviform and practically sub-equal in length; sixth joint only slightly narrowed to base, about four-fifths the length of fifth; seventh narrowing to tip, about two-thirds the length of the preceding; apical joint as broad as tip of the penultimate joint and narrowed to apex. Antennal hairs very long and slender; sense-cones very difficult to distinguish in dried specimens, apparently rather long and acute, and one pair on each of the joints three to six.

Prothorax flat, about one and one-half times as broad as long; mid-lateral, anterior-marginal and spines at anterior angles minute, those at posterior angles apparently longer and stronger, and the posterior-marginal pair exceptionally long. Legs comparatively long, fore-femur as long as the head and slightly incrassate; fore-tibia almost as long as the femur, and fore-tarsus armed with a minute distal tooth. Hind and intermediate legs moderately stout. Pterothorax strongly transverse, wings absent.

Abdomen oblong-ovate, occupying nearly two-thirds the length of the whole insect, and nearly twice as long as broad, widening to the fourth segment and thence narrowing to the base of the tube. Tube three-quarters the length of the head and about twice as long as broad at base, evenly narrowed from base to tip. Surface of tube reticulate and the basal half (or thereabouts) of other segments similarly reticulated. Terminal bristles almost as long as the tube; abdominal hairs long, those on segments seven and nine being longer than the tube; all sub-lateral hairs more than usually long.

♂. The male has the prothorax very considerably swollen, almost globiform, and the fore-legs also much enlarged, the femora being very strongly incrassate and swollen. The fore-tarsus is also armed with a long and strong tooth, whilst the abdomen is longer and narrower in comparison to its breadth.

HAB. Oahu, one ♂, Waianae Mountains, 2—3000 feet, February 1896 (Perkins, No. 553); one ♂ and two ♀s, Mountains near Honolulu, 2—3000 feet, July 1900 (Nos. 667 and 789), and one ♂, Konahuanai Ridge, December 1900.

#### NESOTHRIPS Kirkaldy.

Kirkaldy, Proc. Hawaiian Entomological Society, 1. p. 102, 1907.

"Allied somewhat distantly to *Liothrips* Uzel. Flat above, convex below. Strongly chitinated, with a shining, polished surface.

"Head dorsally about as long as the pronotum, a little longer than wide, lateral

margins sub-parallel. Antennae about twice as long as head. Ocelli present. Eyes not very prominent laterally. Face long, lateral margins sub-parallel, then narrowing apically. Pronotum anteriorly as wide as the head, posteriorly distinctly wider, warts absent. Flight-organs absent. Anterior legs unarmed, femora incrassate, more than twice as long as the tibiae."

Type. *Nesothrips oahuensis* Kirkaldy.

*Nesothrips oahuensis* Kirkaldy.

"Polished, shining, pitchy-blackish; apices of anterior tibiae, the tarsi, etc. paler. Face bristles absent. Antennae 5, 5, 9,  $8\frac{1}{2}$ , 8, 6, 8. Two longish bristles (lateral and sublateral) near the posterior margins of at least five tergites.

"Tube with two terminal bristles.

"Length  $1\frac{7}{8}$  mm.

"HAB. Oahu, Mt. Tantalus, 1300 feet (O. H. Swezey), probably on flowers."

The genus *Nesothrips* would seem closely to approach the preceding genus *Oedemothrips*. In the present form however we find that the ocelli are present and face bristles absent. If the specimens described by Kirkaldy are females (presumably so on account of absence of fore-tarsal tooth) then the fore-femur is considerably longer than in *Oedemothrips laticeps*. The antennae are shown as seven-segmented; it is probable, almost certain, that the two apical joints were closely segmented and the suture thus escaped notice. The statement that the tube has only two terminal bristles is evidently erroneous.

DOLEROTHRIPS, gen. nov.

Allied to *Trichothrips* Haliday.

Head longer than broad, cheeks more or less sparsely spinose, eyes moderately small, ocelli present and post-ocular bristles usually long. Mouth-cone short, broadly rounded at apex. Antennae as a rule twice as long as the head. Fore-femur incrassate; fore-tarsus armed with a well-marked tooth and fore-coxa armed with numerous short stout spines. Anterior-marginal prothoracic bristles usually obsolete; others well developed.

Wings generally vestigial.

Abdomen broad; tube shorter than the head; abdominal bristles as a rule well-developed.

Male smaller, with abdomen not so broad.

Prothorax large and heavy and often strongly convex, as long as or longer than the head. Fore-legs very long and strongly incrassate or swollen, with stout tarsal tooth. The median groove on the prothorax is in most cases prominent, whilst the notum does not attain the lateral margins.

Male with scale (?) at base of tube.

Type. *Dolerothrips flavipes* mihi.

The following table, though rough, may be useful in separating the species<sup>1</sup> :—

- I. All femora yellow ..... *flavipes*, sp. nov.
- II. All femora concolorous with body :—
  - A. Abdominal bristles well developed :—
    - 1. Size larger (3·5 mm.); cheeks slightly swollen and spinose near posterior third ..... *barbatus*, sp. nov.
    - 2. Size smaller (1·6 to 2·5 mm.); cheeks more or less evenly spinose :—
      - (a) Abdomen dark brown, tube light reddish-brown, and almost as long as head ..... *bicolor*, sp. nov.
      - (b) Tube concolorous with rest of body; shorter than head :—
        - i. Tube twice as long as broad at base; lateral bristles on eighth abdominal segment obsolete ..... *perkinsi*, sp. nov.
        - ii. Tube three times as long as broad at base; lateral bristles on eighth abdominal segment present :—
          - (aa) ♀. Size smaller (1·65 mm.); hind angles of eighth abdominal segment acuminate; head long and narrow, one and one-half times as long as broad and slightly longer than prothorax; prothorax narrower; abdominal bristles weaker ..... *angusticeps*, sp. nov.
          - (bb) ♂. Size larger (2·0 mm.); eighth abdominal segment simple, head only a little longer than broad and slightly broader than the prothorax; prothorax large and convex; abdominal bristles stronger ..... *ovatus*, sp. nov.
  - B. Abdominal bristles abbreviated (tube short and very broad)..... *intermedius*, sp. nov.
  - C. Abdominal bristles obsolete ..... *lanaiensis*, sp. nov.

(1) *Dolerothrips barbatus*, sp. nov.

Plate XVIII. figs. 11—14.

♂. Length 3·5 mm.; breadth of mesothorax 0·6 mm.

Colour dark brown, tarsi, fore-tibiae and joints of hind and intermediate legs yellowish-brown.

Head one and three-quarter times as long as broad across eyes, and just as long as prothorax. Cheeks parallel for half their length behind eyes and then rounded out,

<sup>1</sup> *D. dubius* and *D. sp.* are not included in this table.

the swollen part being furnished with five or six spines; vertex slightly raised in the form of a hump.

Mouth-cone blunt and reaching only one-third way across the prosternum. Eyes small, occupying laterally more than one-fifth the length of head, moderately finely faceted; post-ocular spines placed far back and about twice as long as the eye. Posterior ocellus overhanging and looking forward, and the posterior pair on a line drawn through centre of eyes. The antennae are unfortunately broken off with the exception of the first four joints, the second and third joints are sub-equal claviform with the distal half practically parallel, and have the stems shaded with a reddish-yellow colour. There is a pair of short and somewhat obtuse sense-cones on each of these joints.

The prothorax is very massive, as long as the head and two-thirds as long as broad. The mid-lateral angles are broadly rounded, whilst the notum does not reach to the lateral margin, being only four-fifths as broad as the total breadth of the prothorax. All the spines are apparently present; the pair at the posterior margins are long, the mid-lateral pair slightly shorter, the posterior-marginal pair shorter again, and the pair at anterior angles shortest of all, and inwardly curved. The anterior-marginal pair are either very minute or obsolete.

The fore-coxa is armed with several short, stout spines. The fore-femur is nearly twice as long as the head and about two and one-quarter times as long as broad through the middle. The fore-tibia is very broad and placed in such a position on the type slide that its true length cannot be estimated, and the figure probably shows this tibia larger than it should be. The fore-tarsus is armed with a very broad, strong tooth.

The pterothorax is not as broad as breadth across fore-coxae, and only two-thirds as long as broad. The wings are vestigial and take the form of a small pad from which spring two bristles. The hind and intermediate legs are rather short and stout, each is furnished with a series of short spines and each tibia with several short and slender ones and a few longer bristles near tips.

The abdomen is slightly broader than breadth across fore-coxae and has the segments one to seven strongly transverse, narrowing from the sixth segment to the tube; the seventh segment is laterally rounded at its basal half. The tube is twice as broad at base as at its apex, longer than any abdominal segment, and five-sevenths the length of head. The terminal bristles are not strong and about three-quarters the length of tube, whilst the abdominal bristles are long but only moderately strong.

♀ unknown.

HAB. Hawaii; Kona, one male from under a rotten log, 4000 feet (Perkins). Dr Perkins makes a note that he saw no other specimen of that species.



(2) *Dolerothrips flavipes*, sp. nov.

Plate XVIII. figs. 15—19.

Length about 3 mm., breadth of mesothorax about 0.475 mm.

Colour of head yellowish-brown, darker at sides and near vertex; prothorax and pterothorax reddish-brown with sides darker, base and sides of the abdominal segments and the tube, excepting near tip, in most specimens blackish-brown; legs clear yellow; antennae with the two basal joints brown, third and fourth yellowish-brown, shaded darker at apical half, fifth and sixth brown but yellow at stems, and the apical joints wholly brown. In dried specimens the thorax and abdomen are blackish-brown with a light patch on the disc of the pterothorax and similar light patches at each side of at least abdominal segments five to eight, and the legs have also a reddish tinge.

Head only a little longer than prothorax and two-thirds as broad at base as long; surface rough; cheeks roundly narrowing behind eyes and converging to base. Eyes somewhat small and finely faceted, occupying laterally less than one-quarter the total length of head; postocular bristles placed at some distance behind the eyes, long and slender. Ocelli large, the anterior one at the extreme apex, which is slightly raised, and the posterior pair near to the inner margins of the eyes and on a line drawn through their centres. Mouth-cone broadly rounded at tip reaching about two-thirds the way across the prosternum. Maxillary palpi rather short and stout. Antennae about one and two-thirds the length of head; basal joints sub-approximate, second about as long as basal one, narrower and constricted near base; joints three to six broadly claviform, third joint one and one-half times as long as the second and twice as long as the breadth near apex; fourth, five-sixths of third; fifth, five-sixths of fourth; sixth, four-fifths of fifth; seventh joint much narrower than the preceding and four-fifths its length, slightly constricted at base; apical joint narrowed to tip.

Sense-cones acute and moderately long, a pair on each of the segments three to six, those on the sixth segment being longer and stouter than the others. Bristles slender, light coloured and inconspicuous.

Prothorax rapidly widened to the mid-line, dorsal surface moderately convex, about three-fifths as wide as long, and the anterior margin slightly emarginate. Bristles at each posterior angle, posterior-marginal and mid-lateral pairs very long and slender, colourless; anterior-marginal pair obsolete, and pair at anterior angles very short. Pterothorax about four-fifths as long as broad, broader than prothorax but not as broad as width across fore-coxae; sides of metathorax only slightly narrowed to base of abdomen.

Wings absent; legs moderately long, fore-coxa armed with several short and stout spines, fore-femur incrassate, fore-tibia stout and the tarsus armed with a strong tooth.

Abdomen much stouter than pterothorax with segments strongly transverse, gradually narrowing from fifth segment to the eighth and from thence roundly narrowed

to base of tube. Tube not quite twice as broad at base as tip, and two and one-half times as long as broad at base, about five-sixths the length of head; terminal bristles weak, about two-thirds the length of tube. Abdominal bristles short and weak, those at apex of ninth segment about half the length of tube; a longer and stronger dorsal bristle near each posterior angle of each of the segments two to seven. The dorsal surface is in parts weakly raised in irregular and broken longitudinal ridges.

♂. The male has the prothorax larger and more roundly raised than in the female, the fore-legs much more strongly incrassate; the fore-tibia comparatively shorter and stouter and the fore-tarsus armed with a very strong tooth.

The abdomen is a little narrower and the ventral side of the ninth abdominal segment is armed with a pair of short spines.

*Forma macroptera.*

There is a single carded specimen of the winged form in Dr Perkins' collection. The pterothorax is well-developed and the wings are long, reaching beyond the tip of tube, smoky coloured and darkly shaded towards the end.

HAB. Maui.—*Forma aptera*: several specimens including larvae and pupae in alcohol, no date (Perkins); Haleakala (mountain), numerous specimens from under bark, above 5000 ft., April 1894 (Perkins, No. 116); *Forma macroptera*: one female, Haleakala at 5000 ft., October 1896 (No. 661).

(3) *Dolerothrips ovatus*, sp. nov.

Plate XVIII. figs. 1—6.

♂. Length 1.9 to 2.0 mm., breadth of mesothorax 0.5 mm.

Colour dark chestnut-brown, fore-tibiae reddish-brown and all tarsi lighter with base of sixth, basal third of fifth and fourth, and the greater part of third joint yellowish.

Head not quite seven-eighths as broad behind eyes as long; sides sub-parallel then sharply constricted at base; set with a few small spines; frons slightly raised; surface striated transversely. Eyes moderately small and not very finely faceted, occupying laterally about one-fourth the length of head; post-ocular bristles long and set well back. Ocelli moderate in size, anterior ocellus at apex of raised part and the posterior pair on a line drawn through centre of eyes and not quite touching their inner margins. Mouth-cone about three-quarters as long as broad at base, broadly rounded at the tip and scarcely reaching one-half way across the prosternum.

Antennae twice as long as the head, joints three and four clavate; fifth constricted at basal third, subclavate; sixth constricted near base and with the seventh and eighth submoniliform, the apical joint being abruptly constricted at apex. A pair of sense-cones on each of the joints three to six.

Prothorax convex, very slightly longer than the head and about two-thirds as long as broad, surface smooth; mid-lateral and posterior-marginal spines and pair at posterior angles present, long and practically sub-equal. Pterothorax almost as broad as the width across fore-coxae and only about one-third as long as broad. Wings vestigial. Legs moderately long and stout, posterior coxa large and armed with a number of short, stout spines; fore-femur much swollen, smooth; tibia stout and tarsus armed with a strong tooth.

Abdomen broadly ovate, broadening to the fourth segment and thence roundly narrowing to the base of tube. Basal half of each segment excepting the ninth and tenth roughened with a fine reticulated sculpture. A single pair of very weak wing-retaining spines on each of the segments two to eight, and near the apical margin. Tube a little more than two-thirds the length of head, nearly twice as broad at base as at tip and narrowing evenly to apex. Terminal hairs about three-quarters the length of tube, and bristles at the apex of the ninth segment about the same length. Abdominal bristles long and moderately strong.

♀. The female differs from the male in having a shorter, narrower and flatter prothorax. The fore-femur is only slightly incrassate, the tarsus is armed with a smaller tooth; the fore-coxa is small and is only armed with a few short spines, one of which is distinctly longer than the others, whilst the abdomen is decidedly broader, being one and one-third as broad as the width across the fore-coxae. The tube is five-sixths the length of the head and not so slender as in the male.

#### *Forma macroptera.*

As in *D. flavipes*; one specimen has the wings stretching beyond tip of tube and the other only to the base of the tube. The wings are faintly iridescent with an obscure sulphur patch near base.

HAB. Maui; Haleakala, one male and two females at 9000 ft., April 11, 1894 (Perkins, No. 124), and two brachypterous and two macropterous females at 5000 ft., September 1896 (No. 661).

#### (4) *Dolerothrips perkinsi*, sp. nov.

Plate XIX. figs. 17—20.

♀. Length 1·8 mm., breadth of mesothorax 0·43 mm.

Colour very dark brown, almost black; fore-tibiae dark chestnut-brown and all tarsi brownish; antennae dark brown with the basal part of the third joint only yellowish.

Like *D. ovatus* but not so broad; has the head longer and the prothorax comparatively shorter, whilst the antennae, which have the joints three to six distinctly claviform, are only one and two-thirds the length of the head. The abdomen approaches that of *D. lanaiensis* in form, but has the bristles as in *D. ovatus*, though shorter and

slightly weaker, those on the eighth segment being very short and weak. The tube is short and stout, being two-thirds the length of the head and only twice as long as broad at base.

*D. perkinsi* may be recognized from all the allied species by the form and coloration of antennae; from *D. ovatus* by the characters outlined above, and from *D. lanaiensis* by the well-developed bristles.

♂ unknown.

HAB. Lanai, one female, 2000 ft., December 1893 (Perkins, No. 92).

(5) *Dolerothrips angusticeps*, sp. nov.

Plate XVIII. figs. 20—22.

♂. Length 1.65 mm., breadth of mesothorax 0.43 mm.

Colour chestnut-brown, abdomen with reddish-brown sub-lateral patches, fore-tibiae yellowish and all tarsi light brown. Antennae unfortunately broken in the type specimen.

Head linear, long and narrow, one and one-half times as long as broad and a little longer than the prothorax. Fore-coxae with but few spines, one of which is decidedly longer than the others. Prothorax a little more than three-quarters as long as broad, not dorsally convex; mid-lateral bristles and pair at posterior angles very long, posterior-marginal pair shorter and weaker.

Abdomen comparatively broad, segments more distinctly sculptured laterally; hind angles of the eighth segment prominent. Tube long and somewhat narrow, about four-fifths the length of the head and three times as long as broad at base.

♀ unknown.

This species is one of the smallest in the genus, and a very distinct one which may at once be recognized by the long and narrow head, and the form of the eighth abdominal segment. Otherwise it is somewhat similar in form to *D. lanaiensis* from which it may easily be separated by the character of the prothoracic setae and by the presence of well-developed abdominal bristles.

HAB. Molokai; Kalae, one male, August 7th, 1893 (Perkins, No. 172); and Molokai Mts., at 3000 ft., September 8th, 1893 (No. 171).

(6) *Dolerothrips bicolor*, sp. nov.

Plate XIX. figs. 21—22.

♀. Length 2.5 mm., breadth of mesothorax 0.5 mm.

Colour dark brown, head slightly lighter than body and shaded darker laterally and apically. Abdomen deepening towards end to a coal-black; tube light reddish-brown, thus contrasting strongly with the considerably darker coloration of the abdomen;

fore-femora yellowish-brown, lighter apically; all tibiae and tarsi yellowish, hind and intermediate tibiae shaded with brown. Antennae unfortunately broken in the type specimen.

Head with cheeks slightly swollen behind the eyes, one and one-third times the length of prothorax.

Prothorax flat, transverse, nearly twice as broad as long; mid-lateral bristles very long, those at hind angles, and the posterior-marginal pair respectively next in order of length; pair at anterior angles obsolete. Wings vestigial. Fore-legs incrassate; stouter than is usual in the female.

Abdomen almost as in *D. lanaiensis*, but not so broad as in the female of that species, and furnished with rather long bristles somewhat similar to those in *D. angusticeps*.

Tube long and slender, minutely and sparsely setose; almost as long as the head, three and one-half times as long as broad at base, where it is a little more than one and one-half times as broad as at tip.

♂ unknown.

Apart from the form of the head and the long narrow tube, this species may be readily distinguished by the light coloration of the latter segment.

HAB. Oahu; one female, Kaala Mts., over 2000 ft., January 1893 (Perkins, No. 56).

(7) *Dolerothrips intermedius*, sp. nov.

Plate XIX. figs. 7—9.

♂. Length 2.0 mm., breadth of mesothorax 0.45 mm.

Colour dark chestnut-brown, fore-femora lighter, yellowish at apex, and all tibiae yellowish-brown, lightest at knees and with hind and intermediate pairs shaded darker in the middle.

Antennae stout, twice as long as the head, third joint yellowish shaded with brown near apex, basal third of fourth and fifth yellow; joints three to five claviform, sixth narrowing from tip to base and six to eight closely jointed.

Head and prothorax as in *D. ovatus*, the latter irregularly foveolate on each side of disc; post-ocular and prothoracic bristles shorter, mid-lateral pair recurved. Fore-legs somewhat stouter than in *ovatus*.

The abdomen is only very slightly broader than the width across the fore-coxae, narrowing to tube from the third segment. The nature of the chitin appears to be tougher and stronger than in *ovatus*, *lanaiensis* and the other species, excepting *D. barbatus*, and has a duller appearance. Tube stout, three-quarters the length of the head and about twice as long as broad at base and quite twice as broad at base as at the extreme apex. Abdominal bristles moderately short, shorter than in *ovatus*,

*perkinsi* or *angusticeps*, between which species and *D. lanaiensis*, *D. intermedius* may be regarded as somewhat intermediate.

♀ unknown.

The single specimen is unfortunately not a good one, and is not figured as satisfactorily as one would wish. It may, however, be recognized with the aid of these figures.

HAB. Maui; one male, Haleakala, 3000 feet, 1900 (Perkins, No. 809).

(8) *Dolerothrips lanaiensis*, sp. nov.

Plate XIX. figs. 10—16.

♂. Length 1·8 to 2·0 mm., breadth of mesothorax 0·4 mm.

General colour as in *D. ovatus*, knees in most specimens with a brownish tinge. Antennae with the base of fifth joint yellow, basal third of fourth, and the greater part of third yellowish-brown; sternum yellowish-brown.

Head as long as prothorax and seven-eighths as broad as long, sides parallel, roundly constricted at base and set with a few minute spines; surface transversely striate. Eyes rather large and moderately finely faceted, occupying laterally a little more than one-quarter the length of head; post-ocular bristles short and slender, set well back. Ocelli small and widely separated, crimson; posterior pair on a line drawn through posterior third of eyes and touching their inner margins. Mouth-cone as long as its breadth at base, and reaching three-quarters way across the prosternum. Antennae slightly more than twice as long as the head; joints three to five clavate, six and seven fusiform and the eighth narrowed from base to a point at tip. A pair of sense-cones on each of the joints three to six.

Prothorax mildly convex about as long as the head, or slightly longer, and a little more than two-thirds as long as broad; mid-lateral spines moderately long, posterior-marginal and pair at posterior angles short and weak. Pterothorax as wide as the prothorax and strongly transverse. Wings vestigial. Legs moderately long and stout, fore-femur strongly crassate, smooth, and fore-tarsus armed with a stout tooth.

Abdomen elongate-ovate, broadest at third segment and narrowing gradually to the seventh segment and thence more strongly to base of tube. Surface very finely sculptured, a narrow band at the posterior margin of each segment smooth; wing-retaining spines as in *D. ovatus* but weaker. Tube about three-quarters the length of head, twice as broad at base as at tip and three times as broad at base as long.

Terminal hairs about three-quarters the length of tube, weak; abdominal bristles obsolete.

♀. The female is slightly larger and decidedly broader, and has the fore-legs as in the female *D. ovatus*. The mouth-cone reaches across the prosternum, the prothorax being decidedly shorter than in the male; the prothorax is also flat and the prothoracic

bristles, as well as the post-ocular spines are even less strongly developed. The bristles at the apex of the ninth abdominal segment are about one-third the length of tube which latter is two-thirds the length of the head and stouter than in the male.

HAB. Molokai, Lanai, Hawaii.—Lanai, six males and six females, 2000 feet, January 1894 (Perkins, No. 91); one female, 2000 feet, December 1893 (No. 92), and one female above Waipaa about 3000 feet, February 1894 (No. 102).—Hawaii, one male, Kona, 3000 feet, September 1892.—Molokai, Kalae, one male and one female, August 7th, 1893 (No. 172) and one female, Molokai Mountains, August 29th, 1893.

(9) *Dolerothrips dubius*, sp. nov.

Plate XIX. figs. 23—27.

Forma *macroptera*.

♀. Length 2.0 mm., breadth of mesothorax 0.48 mm.

*D. capito* closely approaches *D. ovatus* and may be separated by the form of head (fig. 23) and antennae (fig. 25) and the shorter and more slender fore-legs. The antennae have the stems of each joints 3—5 yellow, the prothorax has a shallow fovea on each side of the mid-line and is irregularly foveolate towards lateral margins, and has more slender bristles than in *ovatus*, the posterior-marginal pair being quite small. The intermediate tibia has a long hair at its distal third on the outside as in *D. ovatus*.

The wings are rather narrow and each fore-wing is tinged wholly with smoky-yellow whilst the hind-wing has the lower half tinged with the same colour for the whole of its length; there are 16 or 17 double hairs in the lower fringe of upper wing near tip. The tube is five-sixths the length of the head and two and one-half times as long as broad at base. The abdominal bristles are not quite so well developed as in *ovatus*.

Forma *aptera*.

Wings vestigial.

It is with reluctance that I give a name to this form—whilst it distinctly differs from any of the species heretofore described it must be acknowledged that we have too slight a knowledge as to the extent of variation in the species, especially as regards the winged forms.

HAB. Hawaii, Lanai, Molokai.

Forma *macroptera*, ♀ Hawaii, one, Kilauea, August 1895 (Perkins, No. 532); one, Kona at 3000 feet, September 1892 (in spirit); Molokai, one, Molokai Mountains at 4500 feet, September 21st, 1893; Lanai, one at 3000 feet (No. 93) and a doubtful specimen at 2000 feet (No. 89). Forma *aptera*, one specimen Molokai, Molokai Mountains, 3000 feet, June 1893 (No. 185).

*Dolerothrips*, sp.

Like *D. dubius* but having the prothoracic bristles as in the macropterous form of *D. flavipes* (Plate XVIII. fig. 18) and the tube slightly shorter compared to the length of head. Abdominal bristles longer.

This is a winged specimen which would appear to differ from *dubius*, chiefly on account of the long prothoracic bristles, and the presence of a pair of short ones at anterior angles. The chaetotaxy of the prothorax is a character upon which one places great reliance, otherwise it might be possible to class this form with the preceding. The single winged female was taken on the Molokai Mountains at 3000 feet in June 1893 (Perkins, No. 185).

We might here emphasize the difficulty of working out a genus like *Dolerothrips* satisfactorily from dried and carded specimens, and we hope that plenty of well-preserved material in alcohol will be placed at our disposal later.

## TRICOTHRIPS Haliday.

There are two Hawaiian forms which may be tabulated as follows:—

- i. Colour chestnut-brown; posterior ocelli remote from inner margins of eyes; tube about four-fifths the length of head and three times as long as broad at base.....*laticornis*, sp. nov.
- ii. Colour black; posterior ocelli touching inner margins of eyes; tube less than two-thirds the length of head and only twice as long as broad at base.....*nigricans*, sp. nov.

(1) *Trichothrips laticornis*, sp. nov.

Plate XVIII. figs. 6—10.

♀. Length about 2.0 mm., breadth of mesothorax 0.45 mm.

Colour chestnut-brown, coxae, forehead, sides of head, prothorax and pterothorax and the apical third of each abdominal segment two to eight darker; fore-tibiae shaded with yellow, and all tarsi, and basal third and tip of third antennal joint yellowish.

Head as wide behind eyes as long, vertex rounded, slightly raised, and bearing the anterior ocellus on the apex; cheeks slightly swollen behind the eyes and roundly narrowed to base. Eyes finely faceted, occupying laterally about one-quarter the length of the head; pigment black; post-ocular bristles long. Ocelli large and widely separated, posterior pair on a line drawn through the centre of the eyes, and remote from their inner margins. Mouth-cone shorter than wide at base, evenly narrowed to tip, and almost reaching to the posterior margin of the prosternum; labium pointed; labial palpi rather large. Antennae almost twice as long as the head; joints three to six broad; joints three to five roughly and roundly obconical, sixth constricted at base, seventh fusiform and eighth narrowly pyriform. Sense-cones long and acute, a pair on each of the joints three to six.



Prothorax three-quarters the length of the head, and one and three-quarters as broad as long. Prothoracic bristles apparently obsolete; although all seta-pits are present I can only discern bristles at the anterior angles, and these are extremely minute. Pterothorax practically as broad as the width across the fore-coxae and slightly broader than long.

Legs moderately stout, fore-tarsus armed with a sharp tooth; intermediate tibia with a long, slender hair at the apical third (i.e. remote from the apex) without, and the hind tibia with a shorter hair near the apex without. Wings present, reaching to the eighth abdominal segment; of a smoky colour and apparently coriaceous.

Abdomen a little broader than the pterothorax, sides sub-parallel from the second to the sixth segments, seventh segment gradually narrowed apically, and eighth roundly narrowed to hind margin. Tube about four-fifths as long as the head, three times as long as broad at base and furnished with what appears to be a well-marked sense-area at apical fourth. Terminal bristles slender and about three-quarters the length of the tube; those at apex of the ninth segment also slender and about the same length as the terminal bristles. Lateral and sub-lateral abdominal bristles long and slender, those on segments six, seven and eight the longest.

♂ unknown.

HAB. Hawaii; Kona, one female, 3000 feet, September 1892 (in spirit).

(2) *Trichothrips nigricans*, sp. nov.

Plate XVIII. fig. 23.

♀. Length 1.8 mm., width of mesothorax 0.48 mm.

Colour black; all tarsi brownish. Antennae unfortunately broken in the type specimen.

Head and prothorax as in *T. laticornis*; head with eyes slightly broader, the space between them less, and the posterior ocelli touching their inner margins. Surface reticulated finely.

Mid-lateral prothoracic bristles very long, those at posterior angles and posterior-marginal pair shorter; others apparently obsolete. A small shallow fovea on each side of mid-line. Legs rather short; fore-pair incrassate and tarsus armed with a short tooth. Wings reaching to the ninth abdominal segment, coriaceous, black, irregularly tinged with yellowish-brown; cilia black.

Abdomen oblong-ovate, broader than in *T. laticornis*, and more roundly narrowed to base of tube. Tube less than two-thirds the length of the head and only twice as long as broad at base. Abdominal bristles long and slender.

♂ unknown.

Apart from being a unicolourous black, *T. nigricans* may be easily separated from *T. laticornis* by its shorter and broader fore-legs, the broader abdomen, and the short and broad tube.

HAB. Oahu; one female, Kaala Mts., over 2000 feet, January 1893 (Perkins, No. 56).

AGNOSTOCHTHONA Kirkaldy.

Kirkaldy, Proc. Hawaiian Entomological Society, 1. p. 102, 1907.

"Belongs to the Tubulifera and differs from *Anthothrips* Uzel by the vertex being very slightly longer than wide anteriorly and slightly though distinctly wider anteriorly than posteriorly; it is longer than the pronotum medianly. Face elongate, angularly rounded at the apex, reaching nearly to the base of the prosternum. First segment of antennae as long as, or longer than, the second, and is much stouter; third and fourth a little wider than the others. Tegmina not constricted medianly. Spine on the fore-tibiae somewhat large in the female."

Type. *Agnostochthona alienigera* Kirkaldy.

(1) *Agnostochthona alienigera* Kirkaldy.

"Sordid yellowish-brown, dark fuscous on head and pronotum and on the 6th—8th antennal segments. Eyes rounded, not protruding. Ocelli widely separated, large, posterior pair contiguous with the internal margin of the eyes, front one almost between first segments of the antennae, which are subcontiguous. Relative lengths (from base) 6, 6, 8, 10, 8, 8, 6, 5; 3rd—6th, basally subpedicellate; hairs moderate. Post-ocular bristles very long, one on each side. Cheeks without bristles. Pronotum roundly emarginate apically, rounded posteriorly, lateral margins distinctly diverging posteriorly, posterolateral angles rounded. Fringe-hairs of wings simple, long. Abdominal bristles sparse, slender, mostly large.

"♀. Tube about one-half longer than the preceding segment. Length about  $1\frac{3}{4}$  mm."

There are many genera allied to *Anthothrips*, and, though in all probability the genus *Agnostochthona* is a valid one, the above characters are much too meagre upon which to erect a genus; in fact as the description now stands the type species may be relegated to any one of several genera, not a single character of generic value is emphasized in the diagnosis. From the short specific description it is clear that the species is not represented in the collection made by Dr Perkins. As yet we have not had the opportunity of examining Kirkaldy's types; this will be necessary before its true position can be made clear.

HAB. Oahu; Mt. Tantalus, 1500 feet, collected by Mr F. W. Terry from under the bark of a dead tree, where it occurred in numbers and in all stages.

## ANTHOTHIRIPS Uzel.

(1) *Anthothrips usitatus*, sp. nov.

Plate XVII. figs. 11—14.

♀. Length 1.9 mm., breadth of mesothorax 0.285 mm.

Colour uniform dark brown, all tarsi yellowish and fore-tibia shaded to yellowish-brown at tip; antennal joints three to five yellow, sixth tinted with brown and the apical and penultimate joints light brown.

Head about one and one-quarter as long as wide through eyes, and one and three-fifths the length of the prothorax, widest behind eyes with the cheeks slightly rounded and narrowed posteriorly. Eyes prominent, occupying laterally about three-eighths the dorsal length of head; obtusely rounded and composed of somewhat large facets, pigment deep shading from a rich crimson to a deep black; post-ocular bristles knobbed, short and slender, about as long as the eye. Ocelli large, the anterior one being placed at the extreme vertex of the head which is slightly raised in the form of a hump between the eyes; and the posterior pair placed above a line through centre of eyes, and touching their inner margins. Mouth-cone blunt at tip and only reaching a little more than half-way across the prosternum; maxillary palpus long and broad with the apical joint more than three times the length of the basal joint and furnished with several sense-bristles at tip. Antennae about one and one-half times as long as the head, sub approximate at base, joints three to six somewhat broadly claviform, practically sub-equal, the fourth being the broadest, and the sixth decidedly shorter and narrower than either of the three preceding joints. Sense-cones slender, long and acute, two on each of the joints three to six; spines slender, rather short and light coloured and therefore inconspicuous.

Prothorax about five-eighths as long as broad, slightly widened to mid-lateral angles; anterior margin emarginate, all bristles present, slender and knobbed, those at each posterior angle longest, those at each anterior angle and posterior-marginal pair long and about sub-equal; anterior-marginal and mid-lateral pairs shorter again and also sub-equal. Surface of prosternum deeply reticulated.

Pterothorax broader than the breadth across fore-coxae, about one and one-quarter times as long as broad; sides of mesothorax sub-parallel, and the metathorax rounded laterally to base of abdomen. Wings present, long and slender, reaching to the sixth abdominal segment, apparently slightly narrowed near middle; median vein obsolete; posterior fringe near apex double for eight or nine hairs. Legs long, the fore-leg slightly incrassate, fore-coxa with one prominent bristle and fore-tarsus armed with a minute tooth.

Abdomen about two-thirds the total length of the insect, and about as wide as the pterothorax; sides sub-parallel to the eighth segment and from thence narrowed to the tube.

Tube about five-eighths the length of head, twice as long as broad at base with the sides narrowing to tip where it is a little more than one-half as wide as at base ; bristles at tip rather long, but weak. Abdominal bristles weak, those on the seventh segment being the longest. There are two pairs of strong wing-retaining spines on each of the segments two to seven.

♂. Very slightly smaller and perhaps more slender, having the fore-legs slightly stronger.

#### Larva.

There are two larvae in a separate tube which may almost certainly be regarded as belonging to this species.

It is a very distinct grub ; broadly speaking it is divided into five transverse zones of coloration, the first fifth crimson, second yellowish-white, third and fifth crimson and the fourth same as the second.

More specifically the head, prothorax and fore-part of mesothorax are crimson with the head tinged with brown, and eyes (which are very small and bead-like) darker ; rest of mesothorax and the whole of the metathorax yellowish-white ; first three abdominal segments crimson ; fourth, fifth and part of sixth segment yellowish-white, and base of sixth, seventh, eighth, ninth and tube crimson, the last two segments being darker than the preceding. There are seven antennal joints, which are dirty yellow and apically darker, the legs too are yellowish and darker at knees.

The bristles are knobbed as in the imago.

HAB. Hawaii ; Kona, several females, two or three males and two larvae found on Hilo grass at 2000 feet, September 1892 (Perkins).

The larvae were not taken with the imagines but occurred on another occasion with an acarid from Hilo grass on Mauna Loa (W.).

#### DICERATOTHRIPS Bagnall.

There is a single specimen, apparently a female, the type of a new species of this genus in Dr Perkins' collection. It is possibly not an endemic form.

We now know three species which may be tabulated as follows :—

Antennae twice as long as head, joints three and four much elongated ; ante-ocular spines long ; fore-femur with a few more or less strong, short spines within.....

*bicornis* Bagnall, *armatus* Bagnall.

Antennae scarcely one and one-half times the length of head, joints three and four not strongly elongated ; ante-ocular spines short ; fore-femur without short spines within .....

*brevicornis*, sp. nov.

(1) *Diceratothrips brevicornis*, sp. nov.

Plate XVIII. figs. 1—3.

♀. Length about 3.0 mm., breadth of mesothorax 0.55 mm.

Colour shining black, fore-tibiae and all tarsi dark brown, apex of second antennal joint tinged with brown.

Head one and three-fifth times as long as broad behind eyes; anterior margin truncate with vertex raised in the form of a hump between the eyes; cheeks furnished with a few short bristles, slightly widened behind the eyes and gently narrowed to base; surface transversely striate. Eyes finely faceted, rounded and occupying laterally about one-quarter the length of head; post-ocular bristles long. Ocelli large, anterior ocellus on the extreme apex of vertex, overhanging; posterior pair on a line drawn through the anterior third of eyes and touching their inner margins. Pair of spines on forehead short, set close to the apical margins of the eyes and scarcely reaching to the apex of the first antennal joint. Antenna about one and one-half times the length of the head, separated at base, and inserted under the vertex; third joint only twice the length of the second and practically sub-equal with the fourth, being but very slightly longer; fifth about three-quarters the length of the fourth; sixth, five-sixths of fifth; seventh, four-fifths of sixth, and the apical joint about three-quarters the length of the penultimate. Sense-cones long and acute, apparently a pair on each of the joints three to six; hairs long and slender.

Prothorax about five-eighths the length of the head and one and three-quarters as wide as long; fore-margin narrowly emarginate, and a depressed transverse line near fore-margin slightly foveolate at each end. Sides diverging to base, and a shallow fovea behind each of these depressions. Bristles at each posterior angle long and very slender, moderately strong; posterior-marginal pair long, mid-lateral pair not quite so long and equally slender; those at anterior angles very short and stout, and anterior-marginal pair obsolete. Pterothorax a little longer than broad; side of metathorax conspicuously reticulated; wings coriaceous, reaching to the base of tube, wholly of a smoky-brown colour. Fore-coxa with one conspicuous but short spine, fore-femur swollen, and without strong spines within; fore-tibia moderately stout, with two short bristles below knee, and fore-tarsus armed with a short, sharp tooth. Hind and intermediate legs moderately long; femora broadened laterally, with a series of fairly long bristles on the outer edge; tibia with one long slender bristle without, near tarsus, and one long and one shorter bristle below knee. Intermediate-tibia with at least one, and hind-tibia with a few short and moderately stout spines near tarsus.

Abdomen slightly broader than the mesothorax, narrowing from the fifth segment to the base of tube. Tube about one and one-eighth times as long as the head and a little more than four times as long as broad at base, sharply constricted just before apex; terminal hairs weak and light-coloured, about two-thirds the length of the tube.

Abdominal spines very long, moderately stout, dark but light-coloured towards tip; those on ninth segment as long as tube. The surface of the tube is minutely asperate, having the appearance of being regularly set transversely with rings of minute scales.

♂ unknown.

HAB. Oahu; one female, in the mountains, Kawailoa gulch, April 1901 (Perkins, No. 768).

*D. brevicornis* very closely resembles *D. bicornis* Bagnall but may be recognized by its comparatively longer head, the short frontal cephalic spines, the shorter and comparatively stouter antennae, and the more slender tube.

In *D. bicornis* the head is broader, the antennae are twice the length of the head, the third joint being three times the length of the second (Plate XVIII. figs. 4 and 5), the frontal spines reach considerably beyond the apex of the first antennal joint, whilst the space between the eyes, and therefore between the posterior ocelli, is much greater. The form of the prothorax and the prothoracic bristles of both species are practically the same. The tube in *D. bicornis* is longer in comparison to the head but is only a little more than three times as long as broad at base. The surface is more shiny than in *D. brevicornis* apparently aciculate, or perhaps finely alutaceous and very sparsely, and very minutely setose. The bristles at the apex of the ninth abdominal segment are decidedly longer than the tube.

#### Suborder TEREBRANTIA.

#### Fam. THRIPIDAE Haliday.

#### HELIOTHRIPS Haliday.

#### (1) *Heliothrips haemorrhoidalis*, Bouché.

Syn. Hinds, Proc. U.S. Nat. Museum, 1903, xxvi. pp. 168—170.

This is a common hot-house pest throughout Europe and North America in which parts of the world it is almost, if not entirely, confined to green-houses<sup>1</sup>. Franklin considers that *H. haemorrhoidalis* is evidently a tropical species, and recently records it in a wild state from St Vincent and the Barbados<sup>2</sup>.

Some of its food plants in St Vincent, he says, are Cacao and Kola, whilst in Barbados it is found on date palms.

There are three specimens in the Perkins collection, one from Kauai and the others from Hawaii, and as Dr Perkins makes no mention of finding them in hot-houses and states that one of the specimens was taken by sweeping, I presume that they were taken in the open, though, at the same time, *H. haemorrhoidalis* is most certainly not an endemic form.

<sup>1</sup> I have just received numerous examples from Spain where they infest banana palms.

<sup>2</sup> Proc. U.S. Nat. Museum.

HAB. Kauai, Hawaii.—Kauai, 1 ♀, Halemanu, 4000 ft., May 25th, 1895 (Perkins, No. 525); 2 ♀, Hawaii, one from Kilauea, August 1896 (No. 656), and the other taken by sweeping, Kona, 2000 ft., September 1892 (in alcohol).

(2) *Heliothrips rubrocinctus*, Giard.

*Physopus rubrocincta* Giard, Bull. Soc. Ent. France, 1901, pp. 263—265.

*Heliothrips rubrocinctus* Franklin, Proc. U.S. National Museum, xxxiii. p. 719, Pl. LXIV. figs. 10 and 14, Pl. LXV. figs. 17, 20 and 21, 1908.

In a recent consignment of named *Thysanoptera*, mostly co-types, Mr Dudley Moulton has sent me larvae and imagines of *H. rubrocinctus* labelled Honolulu, where it occurs on mango. *H. rubrocinctus*, so named because of the bright red band of hypodermal pigment crossing the base of the abdomen on the upper side in the larval and nymph stages, is a very injurious species and is reported as a great pest on cacao in the West Indies; it is found also on Cashew tree, the guava, Liberian coffee (see Franklin) and mango as well as other plants.

Franklin fully describes this species, which is very evidently not an endemic form, and also its earlier stages.

HAB. Oahu; Honolulu, on mango, June 10th, 1909.

THRIPS L.

(1) *Thrips multispinus*, sp. nov.

Plate XVII. figs. 15—20.

♀. Length 1·0 to 1·3 mm. Breadth of mesothorax about 0·24 mm.

General colour brown, legs lighter and fore-tibiae and all tarsi yellow. Antennae uniform brown with the third joint in one specimen apparently lighter.

Head distinctly transverse, cheeks slightly arched behind the eyes and frons faintly arcuate between them. Eyes large and coarsely faceted, sparingly but strongly pilose; pigment deep black. Ocelli large, widely separated, posterior pair above a line drawn across the posterior margin of eyes. Two strong bristles between the anterior ocellus and posterior pair, and another equally long bristle behind each eye. Cheeks furnished with a few short bristles. Maxillary palpus three-segmented. Antennae moderately stout; joints three and four sub-equal with the outline laterally wavy, fifth smaller than three or four and five-eighths the length of sixth, and jointed with a broad surface to base of sixth, the sixth roundly, narrowing to tip; style short, being only about one-quarter the length of the sixth joint, blunt at apex.

Prothorax decidedly longer than dorsal length of head which latter is considerably retracted into prothorax; margins seemingly slightly depressed. Two long bristles at each posterior angle; moderately long anterior-marginal pair and similar pair, on each

side of the mid-line at the posterior margin. One short stout forwardly-directed spine at each anterior angle, and two similar though slightly longer downwardly-directed lateral spines.

Mesothorax widely rounded to juncture of the metathorax, a short spine at each humeral angle; metathorax strongly transverse and only about three-quarters the length of mesothorax. Legs moderately stout and strongly spinose, each coxa armed with one or two curved spines, fore-femora short and broad; bristles long on outer edge of fore-tibia and all forwardly curved. Hind and intermediate tibia with a series of stronger spines for two-thirds the length within, and ending with a couple of very stout spines at the tip within; first joint of tarsus armed with a couple of short stout spines near the tip within, and a long and more slender spine at base without. Wings considerably over-reaching tip of abdomen; both longitudinal veins of the fore-wing armed with a series of regularly placed bristles each consisting of about 17 spines; hairs composing posterior fringes long, slender and wavy.

Abdomen slightly wider than mesothorax, oblong-ovate, strongly narrowing from the seventh segment to tip, tenth segment sharply contracted about the middle; spines at tip of abdomen arranged as in *Thrips tabaci*, long and strong.

♂. Apart from the sexual characters the ♂ differs by its much smaller size, being only about 0.65 mm. in length; totally yellow head and thorax with a reddish-brown tinge; antennae with a greyish-brown tinge; legs yellowish-white; abdomen narrower and shorter, wings long, considerably over-reaching the tip of abdomen.

HAB. Kauai, Molokai, Hawaii.—Hawaii, three females and one male, Kilauea, July 1895 (Perkins, No. 575), one female (No. 686). Kauai, one female Kauai on a high plateau, August 1896. Molokai, Mts., 4000 ft., one female, September 1893 (No. 163), and two females, Kalal, August 7th, 1893 (No. 172).

#### Genus SCOLOTHRIPS Hinds.

##### (1) *Scolothrips 6-maculatus*, Pergande.

*Thrips 6-maculata* Pergande, Trans. St Louis Acad., v. p. 543, 1894.

*Thrips pallida* Beach, Proc. Iowa Acad. Sciences (1895), III. pp. 226—227, 1896.

*Scolothrips 6-maculata* Hinds, Proc. U.S. Nat. Museum, XXVI. pp. 157—158, Pl. IV. figs. 42—45, 1902.

Mr Dudley Moulton tells me (in litt. October 24th, 1910) that he has specimens of this species from Honolulu. It is a very distinct form and the genus is easily separated from *Euthrips* by the presence of six pairs of prothoracic bristles, all very long, strong and sub-equal in length, and by the almost obsolete fore-fringe of the fore-wing, the cilia of which are very much shorter than the extremely long spines on the fore-margin.



It is a Nearctic form and is recorded by Miss Beach from bean, blackberry, elm and hop, by Pergande as having been found on many plants infested with red spider (mite), on which it had repeatedly been observed to feed, and by Bruner as feeding on mites in fold of cottonwood leaf.

From these records it will be seen that *S. 6-maculatus* is an interesting insect, and one of the very few thrips that have been observed to be predaceous in their habits.

HAB. Oahu, collected by Mr D. T. Fullaway on *Psidium* at Honolulu and sent by him to Mr Dudley Moulton of the Californian State Commission of Horticulture, Sacramento, California, to whom our thanks are due for this record.

#### LIMOTHRIPS Haliday.

##### (1) *Limothrips cerealium* Haliday (*avenae* Hinds).

Syn. Uzel, Monographie der Ordnung *Thysanoptera*, Koniggratz, 1895, p. 89.

*Limothrips avenae* Hinds, Proc. U.S. Nat. Museum, 1903, xxvi. p. 138, Pl. I. figs. 10—12; Pl. II. fig. 13: *cerealium* vide Bagnall, Ann. Soc. Ent.

Belgique, 1908, p. 351.

*Limothrips cerealium* chiefly infests cereal crops and has a wide European range, whilst Hinds records it (under the name *avenae*) from Pennsylvania as very abundant on oats during the summer of 1898. I have specimens collected by Mr Champion in Central America, though not yet recorded, and believe that the species will most probably be found wherever cereal crops are cultivated. I have also found it in various grasses and recently recorded it from the flower of the bittersweet (*Solanum dulcamara*); from the sap of a felled pine tree, and in large numbers from the witches broom, on birch<sup>1</sup>. There are two examples of this cosmopolitan species in the collection made by Dr Perkins.

HAB. Kauai, one ♀, Makaweli, 2500 ft., February 1897 (Perkins, No. 703). Hawaii, one ♀, Kona, 2500 ft., September 1892 (in alcohol).

<sup>1</sup> The Journal of Economic Biology, June 1909, LV. pt. 2.

## ACARINA.

By N. D. F. Pearce, M.A.

General remarks on the collection must necessarily be brief, as the small number of species represented in it (nine, besides a few specimens that cannot be certainly identified) is pretty sure evidence that the collection cannot be considered typical of this branch of the Hawaiian fauna. In Britain some hundred species have been identified and described, and a very simple method of collection (merely shaking or preferably slowly drying a few handfuls of moss) will generally produce an enormous number of individuals. But unless a collector's attention has been specially directed to the group, their small size will inevitably lead him to overlook them. I do not know by what method these specimens were collected, and am only surprised that so many were obtained.

Six of these species are well known as British; or perhaps it would be better to say that they differ so little as to be practically indistinguishable. It must be remembered that we can only rely on external characteristics in a case like the present, and even when dealing with recent material the internal anatomy of such minute creatures is almost unobservable.

Of the new species the most interesting is one belonging to the genus *Tegeocranus*. Though some species of this genus are by no means rare in Britain, it is certainly one of the less common genera; thus it has never to my knowledge occurred in Cambridgeshire (although this county has been considerably searched for Oribatidae) and I have but seldom received it from abroad. It appears to me to be a moribund genus. It is of special interest from the extraordinary forms assumed in the immature stages, forms utterly different not only from the adult, but, with an exception or two, from anything acarological, and paralleled only by the remarkable nymphal form of *Leiosoma palmicinctum*: perhaps too among the Tyroglyphidae by the somewhat uncommon Glyciphagi, *plumifer*, *palmifer* and *canestrinii*.

I now proceed to a description of the contained genera and species.

## Fam. ORIBATIDAE.

## Subfam. PTEROGASTERINAE.

## ORIBATA Latreille.

(1) *Oribata globula* Nic.

Twenty-one specimens. A very widely distributed species, occurring in collections nearly everywhere. I cannot see that these differ appreciably from British types. (656 × is a nymph of this species, probably.)

HAB. Hawaii, Lanai.—Hawaii; Kilauea, Lanai; Halepaakai.

(2) *Oribata alata* Herm.

The nine specimens are mostly large and dark-coloured. The species is a very variable one, and by some authorities is sub-divided. Certainly the difference between an extremely small and a large individual seems very great, but all kinds of intermediate forms occur. The shape of the pteromorphae and the amount of their projection in front also varies, this would be expected, as they are of very thin chitin and extremely flexible. The pseudo-stigmatic organs also appear brittle in this species (they are exceedingly long and thin). I have suspected that they are often found with the terminal club broken off. This is known sometimes to occur in other species, so much so that they have even been described from the mutilated condition. I have never been able to recognize these minute differences as worthy of (or indeed assignable to) specific rank. The species is quite cosmopolitan.

HAB. Kauai, Lanai, Hawaii.—Kauai, Makaweli and Koholuamano; Hawaii, Olaa.

(3) *Oribata ovalis* Nic.

One specimen. In no way differing from the type. I have had specimens from India in which the chitin was immensely thickened and roughened, so that they almost seemed a different species. This is not infrequently the case in tropical specimens.

HAB. Kauai, Koholuamano.

(4) *Oribata lapidaria* Lucas.

One specimen. In somewhat bad condition, but probably this species. In Britain it sometimes occurs on trees, lime and thorn, occasionally apple, in vast numbers, literally in masses—and has been accused of doing damage. It is not certain whether this is so, or whether it is attracted by a diseased condition of the tree. I have noticed it swarming on a young apple-tree which was cankered, and shortly afterwards died.

HAB. Hawaii, Kilauea.

(5) *Oribata oriformis*, sp. nov.

One specimen, in spirit. A large species 1.1 mm. in length. Colour light brown, this may have been affected by the preservative. Texture finely punctate, much as in some specimens of *O. orbicularis*. Cephalothorax long and bluntly pointed, lamellae thick blades on edge, cusps very small or non-existent, translamella alive, but quite marked. Pseudo-stigmatic organs small, not projecting much, clavate. Abdomen egg-shaped, produced almost into a point posteriorly (whence the specific name), apparently hairless. Pteromorphae normal, much as in *orbicularis*. Legs long for the genus.

There should be no difficulty in recognizing individuals of this species at any future time, the pointing of the abdomen is not common in this genus.

HAB. Hawaii, Kona.

## FAUNA HAWAIIENSIS

Subfam. *APTEROGASTERINAE*.

NOTASPIS Herm.

(1) *Notaspis lucorum* Koch.

18 specimens. Similar to British examples. A somewhat fragile creature, several are damaged, one mounted on its back, together with a smaller specimen which *may* be *N. tibialis* Nic.

HAB. Maui, Hawaii.—Maui, Haleakala. Hawaii, Kilauea.

NEOLIODES = *Liodes* Heyden.(1) *Neoliodes theleproctus* (?) Herm.

15 individuals. Very widely distributed, and these specimens do not differ much from the type, so that I hesitate to describe them as a new species. At the same time it would be difficult to state positively that they are identical. The species carries its cast larval and nymphal skins, as several others do, and the loss of one or more of these materially affects its appearance.

HAB. Kauai, Lanai, Molokai, Hawaii. Hawaii, Kona—Mt. Roele, Lanai—Halemanu—Lanai—Oahu Mts.—Kauai, Makaweli—Kauai, Koholuamano—Molokai Mts.

HOPLODERMA = *HOPLOPHORA* Koch.(1) *Hoplooderma dasypus* Dugès.

Eight specimens, large and dark and probably this species; *magna* being much rougher, among other differences. The species varies a good deal both in size and colour, as is often the case with creatures which in the larval (and nymphal) stage are wood-borers.

HAB. Kauai, Oahu, Lanai, Hawaii.—Mt. Waimea, Kauai—Kona, Hawaii—Kaala Mts., Oahu—Lanai.

TEGEOCRANUS Nic.

(1) *Tegeocranus pustulatus*, sp. nov.

Two specimens; one mounted on micro. slide. This much resembles *Tegeocranus latus* Koch; that is in general appearance. The chief differences are in pseudo-stigmata and pseudo-stigmatic organs, lamellae, and especially abdominal markings. Size .75 mm.; this is smaller than *latus* (.90 mm.). Pseudo-stigmata very large, projecting laterally and cornucopia-shaped. Pseudo-stigmatic organs short, clavate, not projecting beyond pseudo-stigmata. Lamellae blades on edge, narrow, reticulated, slightly undulating. Abdominal markings small raised dots, sparsely distributed; totally different from the vermiform corrugations of *latus*. I have however a species from the New Forest which is similarly covered with raised dots, it is probably new, it is not this species. Colour brown, not very dark. Legs rather long for the genus.

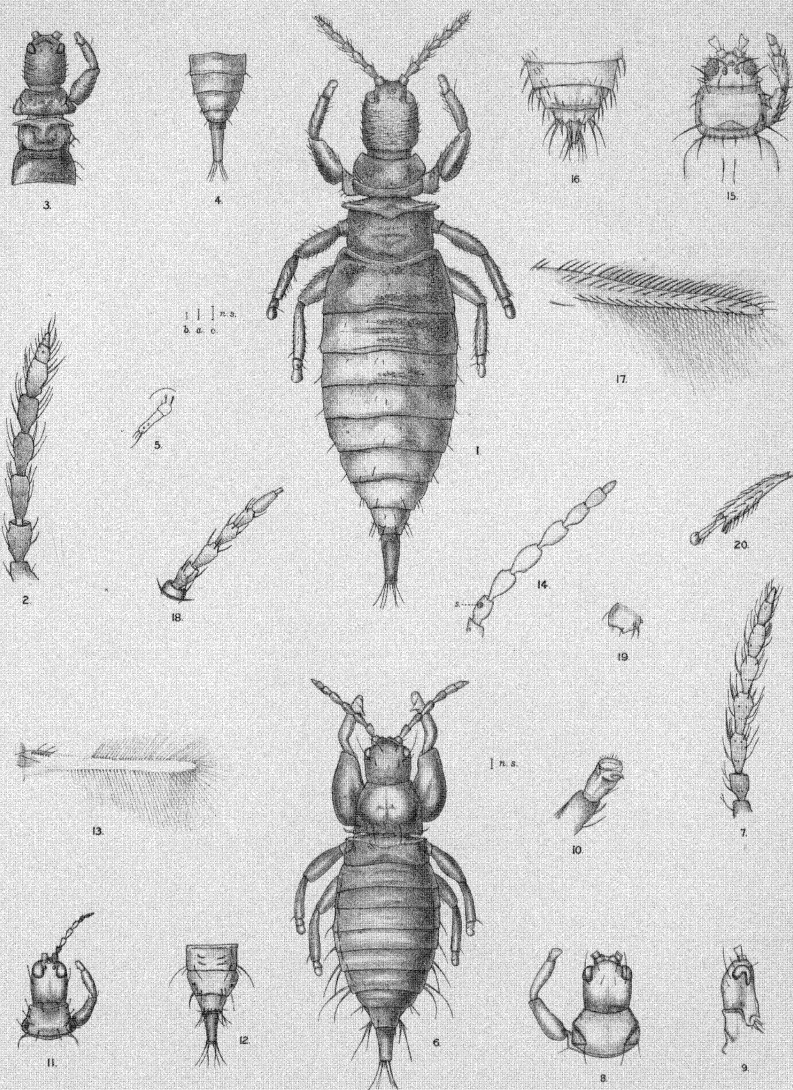
HAB. Molokai Mountains.



DESCRIPTION OF PLATE XVII. (VOL. III.)

THYSANOPTERA.

- Fig. 1. *Dermothrips hawaiiensis*, gen. et sp. nov., forma *aptera*, ♀ × 27; *n.s.* natural size, *a*, ♀; *b*, ♂; forma *macroptera*, *c*, ♀.
- Fig. 2. " " ♀, right antenna × 90.
- Fig. 3. " " ♂, head, right foreleg, thorax and part of abdomen × 27.
- Fig. 4. " " ♂, end of abdomen × 27.
- Fig. 5. " " ♀, maxillary palpus × 120.
- Fig. 6. *Oedemothrips laticeps*, gen. et sp. nov., ♂ × 27; *n.s.* natural size.
- Fig. 7. " " ♂, right antenna × 90.
- Fig. 8. " " ♀, head, prothorax and left foreleg × 27.
- Fig. 9. " " ♀, lateral view of head × 27.
- Fig. 10. " " ♀, left fore-tarsus × 60.
- Fig. 11. *Anthothrips usitatus*, sp. nov., ♀, head, prothorax, right antenna and foreleg × 27.
- Fig. 12. " " ♀, end of abdomen × 27.
- Fig. 13. " " ♀, right fore-wing × 27.
- Fig. 14. " " ♀, right antenna (outline) × 120; *s.* = sensoria.
- Fig. 15. *Thrips multispinus*, sp. nov., ♀, head, prothorax and right foreleg × 40.
- Fig. 16. " " ♀, end of abdomen × 40.
- Fig. 17. " " ♀, right fore-wing × 40.
- Fig. 18. " " ♀, right antenna × 60.
- Fig. 19. " " ♀, right hind-coxa × 60.
- Fig. 20. " " ♀, left hind-tibia and tarsus × 60.



Edwin Wilson, tech. Cambridge

Bagnall, Thysanoptera

Un

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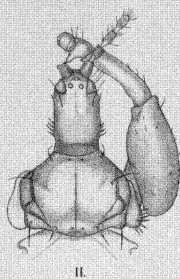




# DESCRIPTION OF PLATE XVIII. (VOL. III.)

## THYSANOPTERA.

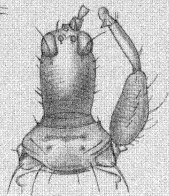
- Fig. 1. *Diceratothrips brevicornis*, sp. nov., ♀, head, prothorax and right foreleg × 27.  
 Fig. 2. " " " " tube × 27; a = surface sculpture.  
 Fig. 3. " " " " joints three to eight (outline) of right antenna × 40.  
 Fig. 4. " *bicornis* Bagnall, sp. nov., ♀, tube (for comparison) × 27.  
 Fig. 5. " " " " joints three to eight of right antenna (for comparison) × 40.  
 Fig. 6. *Trichothrips laticornis*, sp. nov., ♀, head, prothorax and left foreleg × 27.  
 Fig. 7. " " " " end of abdomen × 27.  
 Fig. 8. " " " " part of tube showing s., probable sense areas × 120.  
 Fig. 9. " " " " left antenna (outline) × 90.  
 Fig. 10. " " " " end of mouth-cone showing labial palpi × 120.  
 Fig. 11. *Dolerothrips barbatus*, gen. et sp. nov., ♂, head, prothorax, right foreleg and part of antenna × 27.  
 Fig. 12. " " " " end of abdomen × 27.  
 Fig. 13. " " " " antennal joints one to four × 60.  
 Fig. 14. " " " " right wing-pad × 40.  
 Fig. 15. " *flavipes*, sp. nov., ♂, head, prothorax, and right antenna and foreleg × 27.  
 Fig. 16. " " " " end of abdomen × 27.  
 Fig. 17. " " " " left wing-pad × 27.  
 Fig. 18. " " " ♀, prothorax × 27.  
 Fig. 19. " " " " end of abdomen × 27.  
 Fig. 20. " *angusticeps*, sp. nov., ♂, head, prothorax and right foreleg × 27.  
 Fig. 21. " " " " end of abdomen × 27.  
 Fig. 22. " " " " left wing-pad × 27.  
 Fig. 23. *Trichothrips nigricans*, sp. nov., ♂, tube × 27.



11.



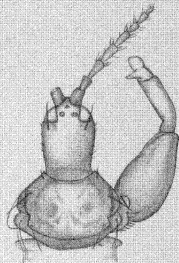
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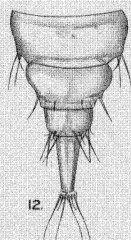
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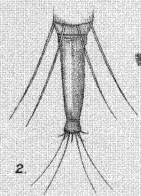
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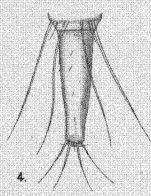
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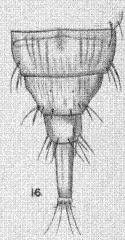
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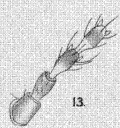
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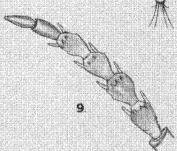
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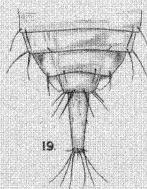
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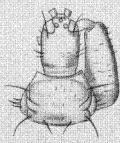
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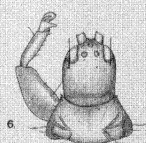
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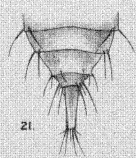
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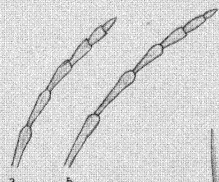
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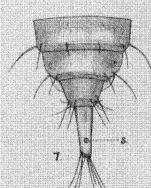


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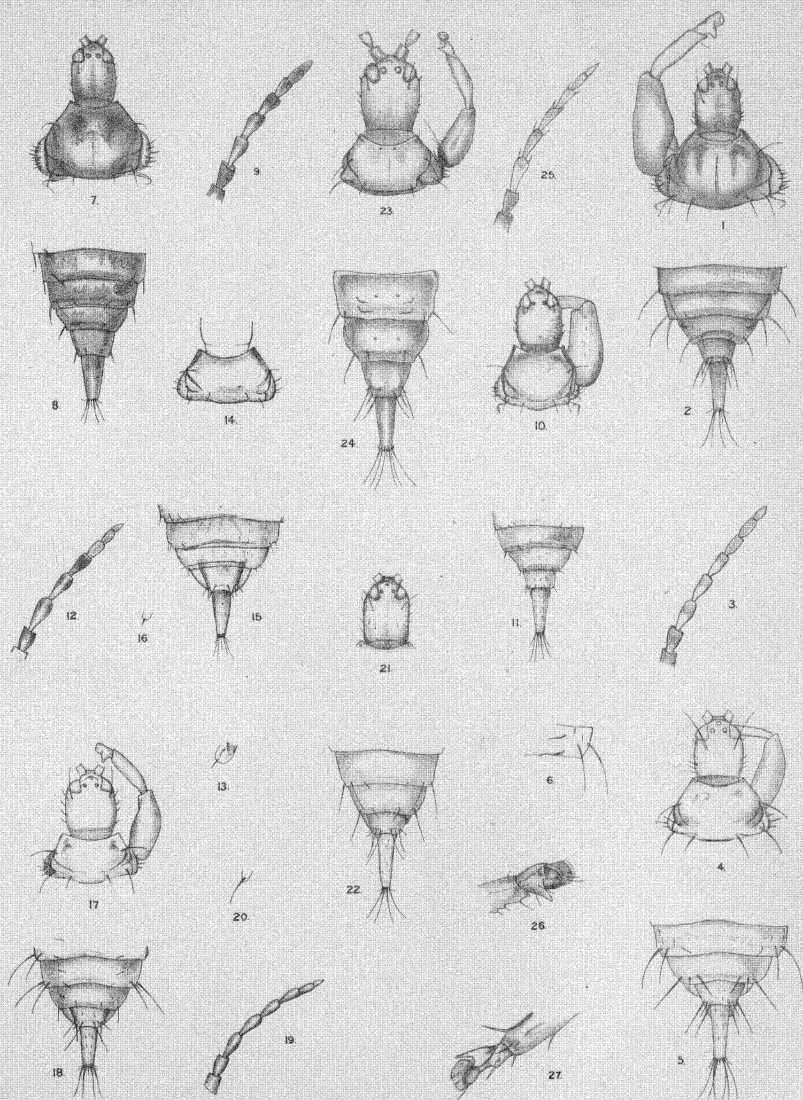




# DESCRIPTION OF PLATE XIX. (VOL. III.)

## THYSANOPTERA.

- Fig. 1. *Dolerothrips ovatus*, sp. nov., ♂, head, prothorax and left foreleg × 27.  
 Fig. 2. " " " " end of abdomen × 27.  
 Fig. 3. " " " " right antenna × 40.  
 Fig. 4. " " " ♀, head, prothorax and right foreleg × 27.  
 Fig. 5. " " " " end of abdomen × 27.  
 Fig. 6. " " " " right wing retaining spines on seventh abdominal segment in the macropterous form × 27.  
 Fig. 7. " *intermedius*, sp. nov., ♂, head and prothorax × 27.  
 Fig. 8. " " " " end of abdomen × 27.  
 Fig. 9. " " " " right antenna × 40.  
 Fig. 10. " *lanaiensis*, sp. nov., ♂, head, prothorax and right foreleg × 27.  
 Fig. 11. " " " " end of abdomen × 27.  
 Fig. 12. " " " " right antenna × 40.  
 Fig. 13. " " " " left wing-pad × 27.  
 Fig. 14. " " " ♀, prothorax × 27.  
 Fig. 15. " " " " end of abdomen × 27.  
 Fig. 16. " " " " right wing-pad × 27.  
 Fig. 17. " *perkinsi*, sp. nov., ♀, head, prothorax and right foreleg × 27.  
 Fig. 18. " " " " end of abdomen × 27.  
 Fig. 19. " " " " right antenna × 40.  
 Fig. 20. " " " " left wing-pad × 27.  
 Fig. 21. " *bicolor*, sp. nov., ♀, head × 27.  
 Fig. 22. " " " " end of abdomen × 27.  
 Fig. 23. " *dubius*, sp. nov., ♀, head, prothorax and right foreleg × 27.  
 Fig. 24. " " " " end of abdomen × 27.  
 Fig. 25. " " " " right antenna × 40.  
 Fig. 26. " " " " anterior tarsus × 60.  
 Fig. 27. " " " " posterior tarsus × 60.



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